Turning Quicksand into Bedrock: Understanding the dynamic effects of disease-focused global health aid on health systems

by

Brian J. Newkirk

M.B.A.
Massachusetts Institute of Technology, 2008

A.B. Government and Legal Studies
Bowdoin College, 2001

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Signature of Author: _____
Harvard–MIT Division of Health Sciences and Technology
And MIT Sloan School of Management, May 7, 2009

Certified by: _____
Ernst R. Berndt, PhD
Louis E. Seely Professor in Applied Economics, MIT Sloan School of Management
Thesis Supervisor

Certified by: _____
Anjali Sastry, PhD
Senior Lecturer in Operations Management/Systems Dynamics, MIT Sloan School of Management
Thesis Supervisor

Accepted by: _____
Ram Sasisekharan
Edward Hood Taplin Professor of Biological Engineering and Health Sciences & Technology
Director of Harvard-MIT Division of Health Sciences and Technology

This thesis is dedicated to Alissa

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Submitted to the Harvard-MIT Division of Health Sciences and Technology in partial fulfillment of the requirements for the degree of Master of Science in Health Sciences and Technology

This thesis asks one basic question: how do "vertical" disease- or intervention-focused global health programs impact the underlying health systems of the nations they serve? Vertical programs—health aid focused on a particular disease, such as HIV, or type of intervention, such as immunization—receive the lion's share of global health aid dollars, and yet we know uncomfortably little about their long-run impact on broader health systems. Many speculate that vertical aid undermines health worker effectiveness, distorts national policies, and disrupts the supply chain for drugs and medical products. Unfortunately, a lack of hard data makes quantitative analysis extremely difficult.

Using the tools of system dynamics, this thesis consolidates the collective wisdom of previously published investigations and anecdotal observations to reveal the field's prevailing "mental model" of the dynamic in question. The result is a set of diagrams that describe the known impacts of vertical programs on health systems, and also reveal dynamic effects not yet explicitly identified in the literature. These effects fall into four sub-systems of impact: care delivery specialization and fragmentation, care delivery development and mediocritization, health policy development and mismatch, and market development and distortion.

These models are then used to better understand the effects of recent contextual developments—the HIV/AIDS epidemic and the emergence of large Global Health Initiatives. Through expert interviews, this thesis identifies the most pressing system stresses in this contemporary context: the commitment to chronic care delivery which HIV/AIDS intervention creates, and the critical need for harmonization between donors which this commitment reveals. Using case examples from Kenya, these dynamics are shown to be active today, and to have instigated mitigation strategies by practitioners in the field.

Finally, the systems identified above bring into focus key leverage points, including donor coordination, health worker augmentation, and engagement of local markets, which can "tip" the impact of vertical programs from harming health systems to strengthening them. In doing so, this thesis provides guidance to policymakers and program implementers who seek to use their resources to strengthen systems and eventually obviate health aid entirely.

Thesis Supervisor: Ernst R. Berndt, PhD
Title: Louis E. Seely Professor in Applied Economics, MIT Sloan School of Management

Thesis Supervisor: Anjali Sastry, PhD
Title: Senior Lecturer in Organization Management and System Dynamics, MIT Sloan School of Management

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All the same, this thesis was a very deep dive into issues of global health that many researchers have spent their entire lives studying. I am tremendously grateful to friends and colleagues who have explored the field with me, educated me, and who have contributed substantively to the content and conclusions in this paper. These people include Rebecca Weintraub, Maria May, Kileken Ole Moi-Yoi, and Erin Sullivan, all of the Global Health Delivery Project at Harvard, the aforementioned Brian Miller, Kevin Croke, John Lyneis, Bill Rodriguez, and Karen Grepin. I am also extremely grateful to my advisors, Ernie Berndt and Anjali Sastry, for their guidance, comments, and help in shaping the form and substance of this work.

A great degree of the substance in this thesis was informed by interviews with world-recognized experts in the field. Several of these individuals requested anonymity, and so as not to inadvertently betray confidences I cannot name them here. However, I am deeply indebted to these people for taking hours out of their days, directing me towards publications and manuscripts, and enthusiastically guiding me along this study.

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Author's Biography

Brian Newkirk is a Master's candidate in the Harvard-MIT Biomedical Enterprise Program. He will receive his Master of Health Sciences and Technology degree from MIT in June, 2009, having earned his M.B.A. in June, 2008 from the MIT Sloan School of Management. Prior to MIT, Brian worked in politics and policy in Washington, D.C., first with the Progressive Policy Institute, a center-left policy think tank, and more recently for Congressman Jim Cooper, representing Nashville, TN in the U.S. House of Representatives. While at MIT Brian interned in Oncology Business Development at Genzyme Corporation, and as a Summer Associate at McKinsey and Company in London, UK. Upon graduation, Brian and his wife, Alissa, will be relocating to London where Brian will return to McKinsey full-time to work with the global health, health systems, and biopharma sectors.

TABLE OF CONTENTS

INDEX OF FIGURES, TABLES, AND ILLUSTRATIONS

Preface

This thesis represents the work of a business school student with one years' medical training and five years' public policy experience in Washington, D.C. It does *not* reflect the diligence and thoughts of someone trained in the language and norms of public health and foreign aid. As a result, the language, theoretical approach, and assumption base may differ from those familiar to readers. At the same time, the philosophy underlying this investigation is fundamentally the same as that which motivates many in the community:

- Individuals have a fundamental right to determine their own "ultimate concerns"—the factors motivating the direction in which they take their life

- Social circumstances such as poverty and health problems shift individuals' "ultimate concerns" from self-determined happiness and success to mere survival; it is a moral imperative of humanity to eliminate these barriers to self-determination

It is my hope that this work will help policymakers, donors, and providers of global health think more systematically about the impact that their programs may have on the health systems in which they operate. By understanding the entire system of impacts rather than the seemingly discrete environments in which programs operate day to day, global health aid can be made more effective, efficient, and eventually...obsolete!

Chapter 1: Introduction

Four billion people on earth lack adequate access to medical care. Basic medical interventions, available to most (but not all) in the developed world, are simply not on offer in many communities worldwide. The result is a tragedy of staggering proportions—millions of needless and preventable deaths every year, and millions of people economically and socially hobbled by disease. What's more, the absence of healthcare means an absence of what could otherwise be substantial markets for medical goods designed for use in developing world environments.

More than ten billion dollars flow each year from the developed to the developing world with one specific purpose: to reduce the gaping disparities which exist between health outcomes of the world's rich and the world's poor. While such disparities exist even within the United States and other developed nations, the simple fact is that the average life expectancy at birth in the 50 richest countries in the world (GNI per capita 2006, PPP) is 77 years, while in the 50 poorest it is 56. In the richest countries in the world, one baby dies before age 5 for every 120 live births, while in the poorest, this ratio is 1 to 8 according to the WHO. Diseases such as malaria and cholera, once endemic and now extinct from most developed nations kill more than as 5 million people per year in the developing world for wont of prevention and treatment, according to WHO statistics (AlertNet 2006).

The human community's response to these disparities has been laudable, if imperfect. Spurred by global scourges such as HIV/AIDS and the concomitant uptick in tuberculosis, Western governments and private donors now spend close to $14 billion per year to prevent and cure illness in the world's poorest countries (England 2008). Aggregating such spending into a single number can be misleading, however. In truth, one-third is earmarked for HIV/AIDS prevention and treatment (England 2008). The GAVI Alliance (formerly Global Alliance for Vaccination and Immunization) directs the

vast majority of its funds towards vaccine delivery and development, having spent $3.5 billion since 2001. The World Bank focuses the majority of its health aid on specific diseases, for example, spending $300 million in 2006 specifically to control malaria in East Africa (WHO 2008).[1] The fragmentation does not stop even there, as these funds are spent in close to 100 countries worldwide, some through national ministries and some given directly to tens of thousands of private non-governmental organizations (NGOs). Importantly, some funds flow through existing financing and governance mechanisms to support and develop existing health care infrastructure, and some funds circumvent established systems to build new clinics, train workers, and deliver care to patients afflicted by a specific disease or in need of a particular type of intervention. In the end, it is this distinction—providing "horizontal aid" to support an entire health system within a country, versus "vertical aid" focused on attacking a specific disease or group of patients, often outside of the existing health care system—which inspires the most vigorous debate among academics and practitioners of global health delivery.

The purpose of this thesis is to parse what have become ideological arguments for and against "vertical" and "horizontal" aid, and arrive at the most important strategies for ensuring effectiveness of aid for health care. Relying on an extensive literature review, I will trace the previously observed and hypothesized effects of vertical aid on health systems. Using a system dynamics framework, I will then assemble these effects into a universe of interactions that the collected experience of practitioners and theorists has revealed over the past several decades. I hypothesize, however, that the field of global health has itself learned to work around many of the most detrimental effects, so through a series of interviews with subject matter experts, I will overlay important elements of the current global health system on this broad framework to identify key leverage points, and then demonstrate its utility by applying the framework developed to better understand the dynamics of the Kenyan health system. Finally, I will identify

[1] Indeed, funding is so fragmented that it is impossible to find a comprehensive accounting of who spends what on which diseases in which countries. It is clear that the field of global health delivery could benefit from a survey such as G-FINDER, which Australian researcher Mary Moran and colleagues have used to characterize research and development funding for treatments for neglected diseases (Moran, et al., 2009).

elements of context that lie at the core of these effects, and mitigation tactics that transform challenges to system strength into opportunities for system improvement.

Chapter 2: Conceptual Framework and Methods

Conceptual Framework and Definitions

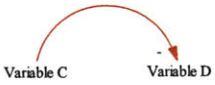
In seeking to understand causality in relationships between global health aid, vertical programs, and health systems, I use the tools of System Dynamics. System Dynamics is a methodology that at its core seeks to understand causality in complex systems in order to identify key points of leverage and spillover effects that may not be obvious to policymakers upon first examination. System Dynamics can be used qualitatively to understand logical links within a system, or quantitatively to quantify the impact of various scenarios. As the reader will see, the variables identified as causal in the system examined through this thesis do not naturally lend themselves to quantification, and so it is the qualitative utility of System Dynamics that will provide insight.

The Tools of System Dynamics

Throughout this thesis I will use a tool of system dynamics called Causal Loop Diagrams (CLDs). CLDs use arrows, colors, and "+" or "-" characters to depict causal relationships in a system.

For example:

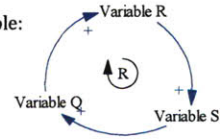
Variable A causes an increase in Variable B



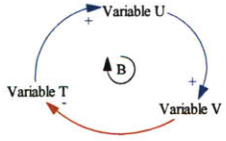
Variable C causes a decrease in Variable D

As these causal relationships are assembled into a system, they can form loops of effects. These loops can either reinforce the causal relationships contained in the loop (a "virtuous" or "vicious" cycle in common parlance), or they can balance the increases or decreases of variables in the system, bringing the system towards a stable equilibrium (a self-cancelling or equilibrating cycle).

For example:



Variable Q increases Variable R, which increases Variable S, which in turn further increases Variable Q. This is a reinforcing loop.



Variable T increases Variable U, which increases Variable V, which decreases Variable T, in turn Decreasing Variable U. This is a balancing loop.

Finally, for the purposes of the diagrams contained in this thesis, some variables are placed in circles and some in squares. This is merely intended to help the reader identify the "starting point" (circles) and "output" (squares) of the system.

For example:

Box 1: The Tools of System Dynamics

The starting point for this investigation is the question at the front of an aid donor's mind when considering a global health intervention: "If my goal is to improve the health of people within a country as much as possible, should I create my own infrastructure, governance, and/or funding stream, or integrate my program within the existing health system?" This assumes that a donor's object is, in essence, to make itself obsolete by ultimately decreasing the disease burden and increasing the capacity of a country to address its own health care needs. In reality, decisions are far more complex, and factors such as acute disease outbreaks, internal and external political pressures, and macroeconomic factors weigh heavily on the decision. To the extent possible these factors have been captured in this investigation.

A donor's decision to pursue vertical or horizontal funding is pictured on the following diagram:

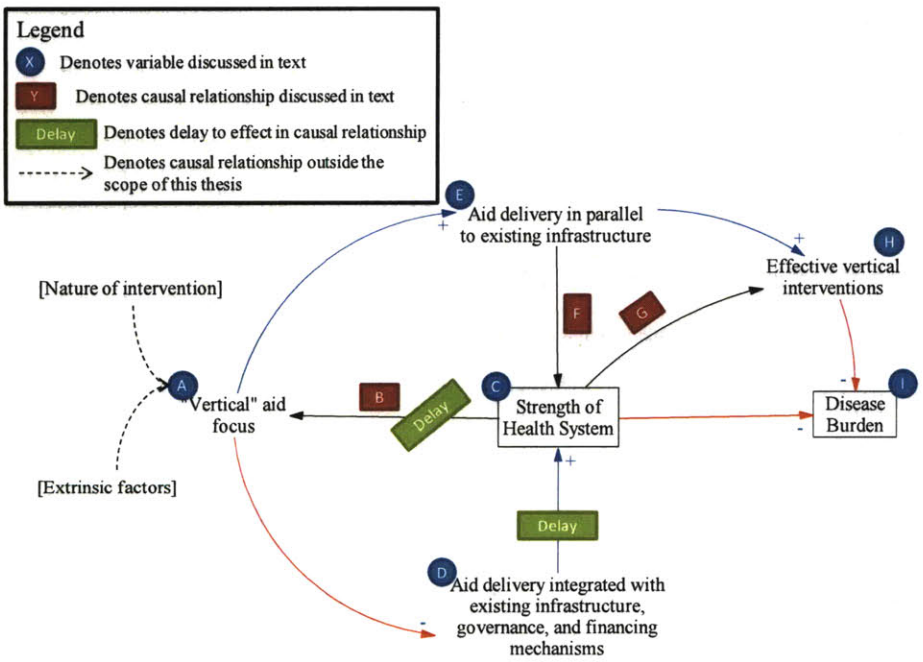


Figure 1: The Dynamics of Health Aid

An aid donor must decide (A) whether to target aid vertically or horizontally. The underlying strength of the health system (C) presents opportunities and barriers to impact which cause (B) the donor to either integrate aid through the existing system (D)

or deliver aid in parallel to the existing system (E) (Mills 1983). Aid delivered in parallel to the existing system (E), ideally results in effective vertical interventions (H) and an overall decrease in the disease burden (I). However, vertical aid (E) also impacts (F) the underlying strength of the health system (C), which in turn impacts (G) not only the effectiveness of vertical interventions (H), but also (B) the very decision to adopt a vertical or horizontal focus (Unger, De Paepe and Green 2003).

This framework provides a map for the investigation pursued through this report, starting with the decision point (A) and ending with the ultimate impacts (C) and (I). It also hints at some potential dynamic effects which will bear close consideration. For example, a weak health system may favor vertical interventions, which may weaken the health system even more and not only drive even more vertical aid through (B), but actually undermine the effectiveness of that aid through (G). This type of self-defeating effect is important to understand in designing effective aid programs.

As can be seen in Figure 1, three causal relationships lie at the heart of this system. First, the strength of the underlying health system in some way impacts the decision to fund vertical rather than horizontal interventions. This relationship is worthy of deep investigation, but will be addressed only briefly in this thesis. Second, vertical interventions in some way impact the underlying health systems around which they operate. This is an area of intense discourse in the literature, and mapping causality within this area is the focus of this thesis. Finally, the strength of the system in some way impacts the effectiveness of vertical interventions. This thesis will address such causality insofar as it is related to the effects of system strength on vertical interventions.

For the purposes of this investigation, "vertical" programs are defined as programs that are, 1. funded by donors outside of the system of national revenue and budgeting, and 2. designed to address a specific disease or basket of interventions to the exclusion of other elements traditionally considered to be elements of primary care. "Vertical programs" can just as easily be implemented and run by governments as by donors. Emergency health care interdiction in the United States, for instance, is likely to be run

through a variety of coordinated third parties from planning through to delivery. Mass immunization campaigns to eradicate polio and smallpox can easily be run by governments in parallel to an underlying healthcare infrastructure. Such programs are not the focus of this investigation. Rather, through this investigation I seek to identify, explicitly, the impact of donor funds administered in whole or in part in parallel to government health systems and planning processes. This would also, therefore, exclude donor funds administered through Sector Wide Approach (SWAp), Sector Wide Management (SWiM), and other government-directed basket approaches to aid (Peters and Chao 1998).

In addition, the "health system" of a country is not limited to government funded and staffed clinics. Indeed, the majority of health care in many developing countries is actually provided through the local (and largely unregulated) private sector. One could easily conceive of a situation wherein an NGO strengthens a health system by somehow ensuring quality and accessibility of care through this private sector. Similarly, it is possible that NGOs could substantially weaken a health system by making such providers less safe and diverting patients to seek help there.

Methods

Literature search

The library of authoritative literature that serves as the starting point for this report's models of causality was culled from the overall body of literature relating to vertical and horizontal global health interventions by the following process:

1. Complementary searches via Google Scholar and ISI Web of Science on the terms "Vertical," "Horizontal," "Disease-focused" and "Health Systems Strengthening" in combination with "Global Health" to identify most frequently cited relevant reports and articles ("authoritative works")(author's discretion was necessary to weed out irrelevant work). This methodology deliberately excluded literature that examined effects of specific programs, and reviews identifying specific areas

of impact (i.e. workforce), in order to gather from the literature those effects deemed to be most important across interventions and areas of impact.

2. Initial list of authoritative works was cross-referenced with opinions of four subject matter experts to identify sources not listed in Google Scholar or ISI Web of Science, and also to identify recently published influential works.

Initial causal diagramming

Authoritative works were read systematically to identify hypothesized causal relationships between health systems and disease-focused funding. Because in many cases unspoken assumptions underlie hypothesized causal impacts, the author was required to infer either intermediate causal links or end causal effects, and noted such instances in research notes.

Hypothesized causal relationships were then grouped to identify meta-causal effects. The first such grouping segmented relationships into those which cause the establishment of parallel infrastructure, governance, and/or financing, and those which are caused by the establishment of parallel infrastructure, governance, and/or financing. The second such grouping further divided the causes of "verticalization" into relationships resulting in the establishment of parallel infrastructure, governance, and/or financing, respectively, and the second into relationships resulting from parallel systems which impact specialized care delivery, primary care delivery, resource allocation and policy, and the internal economy surrounding health care.

Using Vensim PLE Version 5.7, published by Ventana Systems, causal relationships were mapped into causal loop diagrams, with the intention of describing underlying dynamic effects of vertical programs on a health system.

Secondary data gathering and investigation

To validate and refine the models derived from the literature search, and to identify instructive case examples of such effects and successful attempts at circumventing them, ten experts were interviewed in person and remotely over a period of four weeks. These experts included one representative of a large Global Health Intervention (GHI)

donor, three expert academics with field and policy experience, the chief executive of one of the world's largest implementers of global health programs, three leaders of delivery-oriented NGOs, and two individuals who have been investigating these issues in the field through interviews with stakeholders in several developing countries. In addition, I conducted formal and informal interviews with patients and practitioners while working in the Kenyan health sector for four weeks. Data from these interviews was incorporated into models, and case examples incorporated into the descriptive report below. Mitigation strategies listed in this document are a combination of case examples from literature and interviews, and the author's own hypotheses, and are identified as such.

Chapter 3: History of the Current Debate

The history of the vertical vs. horizontal approach to health aid is one of oscillations: A push for the "ideal" of building integrated and comprehensive health systems, a pragmatic shift towards targeted interventions, uproar over those left behind by vertical programs causing a shift in focus back towards system-wide intervention, and pragmatic concerns once again turning programs back towards focused interventions, albeit with a few lessons learned.

Figure 1 is useful in helping to understand these oscillations. System Dynamics theory tells us that oscillations are an interaction between short- and long-term effects within a system—generally, the mitigation of short-term impacts by delayed longer-term impacts. As a simple example, imagine cooking on an electric stove. In heating a sauté pan, the chef turns the heat to "5" on the dial, hoping to find the optimal temperature. However, when butter is placed in the pan it burns, so the chef turns the dial down by several notches. There is a substantial delay before the heating element and pan respond to the input, however, and in a minute or so the chef learns that the pan is now too cold. Turning the temperature up again he hopes to hit the right mark, but in his eagerness to get the food in the pan overcompensates a bit and, although closer to the mark this time, once again burns the butter.

Figure 1 shows how an international health system parallels this analogy. In making an initial funding decision, donors can choose to fund health systems or vertical programs. If health systems are chosen, a substantial delay to impact causes donor stakeholders to press for immediate aid. This shift to vertical aid has relatively immediate impact on the nation's disease burden, but if such interventions also undermine the health system they will, over time, generate political will and practical concerns that tend to favor horizontal programs. Vertical interventions can also inadvertently undermine outcomes such as decreased morbidity and mortality, spurring a shift in strategy. To counteract this effect further aid is pumped into health systems, but once again delays make stakeholders impatient and when the next crisis hits vertical programs are once again the fashion.

This lens helps us understand where we are and how we arrived here. As Mills points out in her 2005 retrospective on the debate, the "Vertical vs. Horizontal" tension was first brought to the fore in 1965 by C.L. Gonzales, an employee of the Venezuelan Ministry of Health. Gonzalez looked back on fifteen years' worth of WHO interventions to better understand the relationships between "mass campaigns" and "general health services". (Gonzalez 1965) Although he found advantages to both types of intervention, Gonzalez cautioned against specializing front-line health workers for fear of losing the nucleus of basic health services. (Mills 2005) Even still, the WHO as the main vehicle for health development aid at the time continued to pursue a strongly vertical aid delivery strategy, as through its Polio Eradication Initiative.

Several decades of vertical aid initiatives—some successful, some failed, but most constructed as stand-alone programs—led the global community in 1978 to declare at the International Conference on Primary Health Care at Alma Ata, USSR, that, in essence, access to primary health care infrastructure was a fundamental human right, and that it was the international community's responsibility to see to the development of such infrastructure. "A main social target of governments, international organizations and the whole world community in the coming decades should be the attainment by all peoples of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life. Primary health care is the key to attaining this target as part of development in the spirit of social justice." (Declaration of Alma-Ata September 6–12, 1978). However, just one year later an equally emphatic call from researchers Walsh and Warren suggested serious revisions to Alma Ata's vision of widespread support for primary health care-based health systems. Citing the need to ensure "cost-effective" aid utilization, Walsh and Warren promoted "selective primary care," a compromise between PHC and vertical approaches whereby aid would target logical groupings of diseases and interventions such as child and maternal health (Walsh and Warren 1979). In practice, selective primary care looked much like the vertical programs of the past, and as epidemiological crises such as drug-resistant tuberculosis, the failure of malaria eradication, and HIV/AIDS emerged in the late 1980s, both donor

and health ministry policies shifted even further towards vertical, disease-focused programs. (Msuya 2005)

By the year 2000, global health aid was as vertical as it had ever been. The HIV/AIDS emergency in the 1990s had transformed the level of global attention and support for health development aid. HIV/AIDS, as a newly emerging and high mortality disease linked at first with specific, easily identified populations such as homosexuals and injection drug users, seemed naturally suited for vertical interventions, and fear and stigma was undoubtedly an incentive to separate HIV/AIDS interventions from mainstream primary health care. Twenty years after Alma Ata's call to arms in supporting equitable primary care, the world's Millennium Development Goals (MDGs) struck an opposite tone, focusing on universal access to HIV/AIDS treatment, and reversing the incidence of malaria and other infectious disease. The fourth and fifth MDGs called specifically for reductions in child and maternal mortality, recalling Walsh and Warren's selective primary-care, and not Alma Ata's grand PHC vision.

Soon after the MDGs were set as benchmarks the vertical funding floodgates opened, although not without caution to keep sight of health system strength. The Global Alliance for Vaccines and Immunization (now GAVI Alliance), launched in the spirit of the MDGs nine months prior to the actual UN Millennium Declaration, pledged to use a $750 million grant from the Bill and Melinda Gates Foundation to "save three-million children's lives a year by ensuring that they are vaccinated against preventable diseases," notably polio, diphtheria, tuberculosis, pertussis, measles, and tetanus (World Economic Forum 2000). Interestingly, in speaking on behalf of the beneficiaries of such funds, Joaquim Alberto Chissano, President of Mozambique, cautioned the global community not to lose sight of health systems in distributing vertical aid, calling on the developed world to spend resources to develop the health sectors in the developing world (World Economic Forum 2000). That warning aside, the major global health aid efforts emerging in the early 2000s were similarly vertical, the most prominent among them being the Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM).

The several years following the MDGs saw a final shift back towards PHC, less out of an ideological push for primary health care and more out of a practical concern that bad health systems were hampering vertical aid delivery. The WHO Commission on Macroeconomics and Health called in 2002 for an integrated "close-to-client" model of health care delivery, largely to address inefficiencies in cost and access observed in interventions to-date (Commission for Macroeconomics and Health 2002). High-profile failures of vertical programs, such as the WHO 3 by 5 initiative, were attributed at least in part to lack of appropriate health care infrastructure (WHO 2004). Researchers spoke of the "Double Crisis" of developing countries—raging disease burden, and weak and weakening health systems—and cautioned donors to work to strengthen, rather than fragment, underlying health systems (Chen, Evans and al 2004). As will be discussed in chapter 5, the very nature of HIV as a chronic disease put pressure on donors to support systems more broadly than simply treating HIV and AIDS.

As vertical funding continued to increase through not only the Global Fund but also the Bill and Melinda Gates Foundation and the President's Emergency Plan For AIDS Relief (PEPFAR), disease-focused programs proliferated, as did the chorus of their detractors. On one side, global figures such as former President Bill Clinton suggested that vertical programs, in building infrastructure and training health workers, would in the long run enhance the overall health system capacity in recipient countries (Clinton 2008). On the other side, observers such as Laurie Garrett decried what they saw as opportunities to build capabilities neglected by a focus on "cost-effective" vertical interventions (Garrett 2007). Traditional vertical donors such as GAVI began experimenting with aid for "Health Systems Strengthening" (HSS), and as in the Alma Ata era, thinkers began agitating towards a renewed focus on building primary health care systems rather than curing individual disease burdens.

Today we are at a turning point, much as we were prior to Alma Ata and the Millennium Summit. Several efforts, such as the WHO's Positive Synergies Project, are aimed at understanding how donors can better use vertical funding to strengthen health systems. At the same time, a fair amount of vitriol is cast by those who accuse vertical advocates

of short-sightedness and bean counting, and by those who accuse horizontal advocates of impracticality and, essentially, fiddling while Rome burns. What's more, both donors and NGOs are now agitating to "scale-up" by broadening programs from their vertical roots.

The system's most recent oscillation shows clear support for building health systems, the reasons for which will be explored in greater depth in chapter 5 of this report. That being said, donors are also reluctant to abandon the benefits of efficiency and measurable health impact which come with vertical programs, and instead seek to leverage vertical programs to systematically develop the underlying health systems in the countries where they operate. The identification of the potential for such synergies and the most common pitfalls in health aid is the focus of the review that follows.

Chapter 4: Results of Literature Search

Using the conceptual framework and methodology outlined in preceding sections, I have combed the authoritative literature to identify: 1. Effects of health system status on the decision to fund vertical programs and 2. Effects of vertical aid on health systems and disease burden.

The decision to fund vertically

In general, health care is thought to be delivered most effectively when patients have universal access to a unified system for education, prevention, diagnosis, and treatment. Primary Health Care (PHC), "the first level of contact of individuals, the family and community with the national health system," was codified at Alma Ata as essential to a well-functioning system (Declaration of Alma-Ata September 6-12, 1978). This is the essence of the horizontal approach to aid for developing health systems—support for the fundamental primary, secondary, and tertiary health care architecture from which all patients derive fundamental care and benefit.

Why, then, is so much global health aid focused instead on specific diseases and interventions? One major factor is that donors face substantial pressure from their own stakeholders, be they a government, citizenry, or even corporate shareholders. These constituencies demand evidence of short-term, tangible, quantifiable impact to justify continuation of aid programs in annual and biennial funding cycles. In addition, donor motivations often require that aid impact be easily traceable to the donor party, such as the soft-diplomacy carried through PEPFAR's interventions in Africa. In the words of former US Secretary of Health and Human Services Tommy Thompson, "What better way to knock down...the barriers of ethnic and religious groups that are afraid of America...than to offer good medical policy and good health to these countries?" (Iglehart 2004). The impact of vertical interventions is more easily separable from system strengthening for public relations purposes, and the branding possible with vertical infrastructure, in particular, is difficult to replicate with health systems strengthening.

As interesting as extrinsic political pressures are, wide variability and intractable opacity make them difficult to investigate, so unless otherwise noted they will be treated as fixed extrinsic variables in this investigation. Similarly, the nature of the problem addressed by an intervention has substantial influence over whether a vertical or horizontal approach is most appropriate. For example, malaria vector control is in essence an environmental program, involving mosquito spraying and elimination of standing water, so naturally such funds, governance, and infrastructure should be separate from a PHC infrastructure. Even so, substantial benefit can come from integrating, for example, a well-functioning PHC system's epidemiological monitoring capability with vector elimination efforts. Like political extrinsic factors, however, the specifics of particular types of intervention add complexity that is infeasible to address in the course of a master's thesis such as this.

Outside of political and intervention-specific factors driving the vertical focus of aid, practical factors can make system support unrealistic or undesirable. Limited resources, dysfunctional governance, substantial system gaps and a history of failed interventions all make vertical interventions a relatively attractive alternative for donors seeking to impact lives in the developing world.

Classes of Constraints

The system-intrinsic factors which drive donors to pursue vertical interventions can be categorized along two useful axes. The first of these differentiates fundamental resource constraints from idiosyncratic system constraints: matters of limited physical, human, or financial resources (Resource Constraints), versus the result of dysfunction in the development, management, and utilization of such resources (System Dysfunction). Consideration of constraints along this axis is important as it effectively separates problems that can be solved with money from those that cannot be solved with money, as will become clear below.

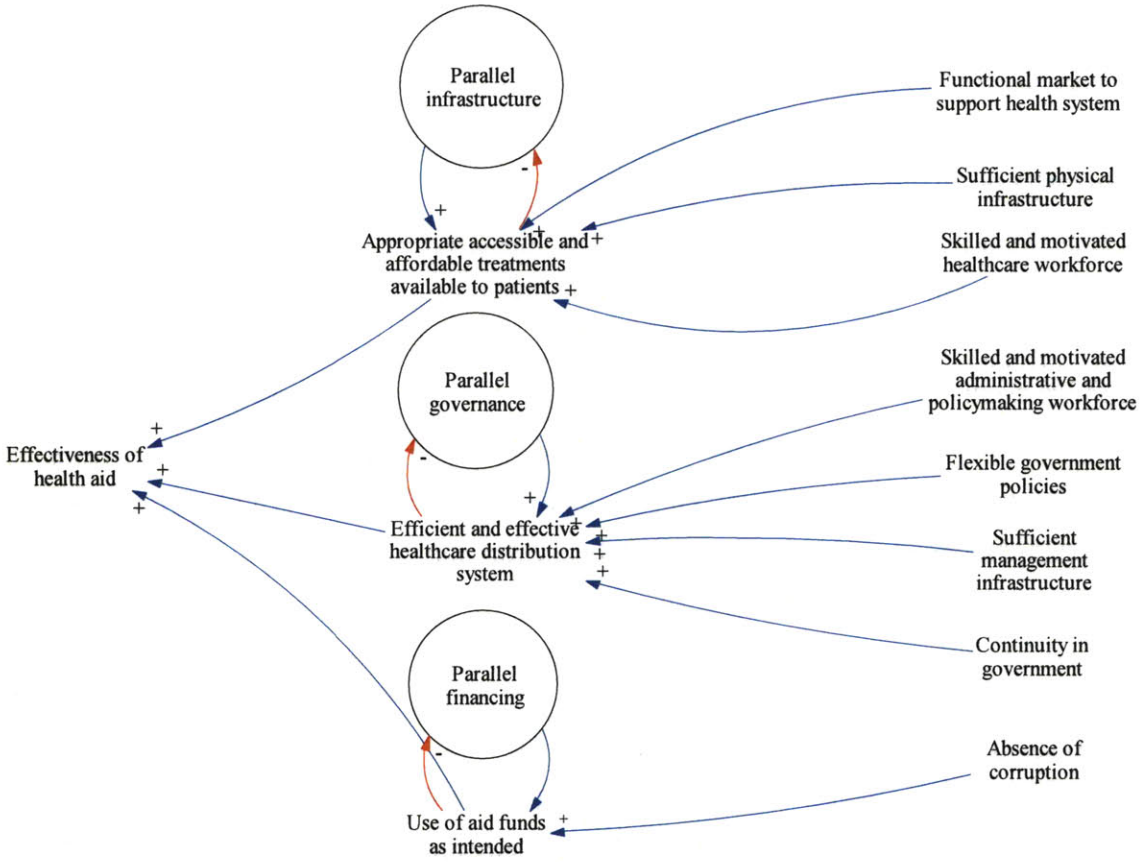


Figure 2: Drivers of Parallel Infrastructure, Governance, and Financing

Resource Constraints

As shown in Figure 2, several of the factors which the literature suggests are crucial to the success of vertical programs stem directly from limited resources. Specifically, sufficient physical infrastructure and management infrastructure are required for a program to succeed. If the underlying health system lacks these resources, a donor and implementer must either work to develop those resources that do exist, or build them in parallel to the existing system.

The World Health Organization's Commission on Macroeconomics in Health estimates that providing a package of "essential health interventions" would cost at least $34 per capita in 2007 and $38 per capita by 2015 (Spinaci, et al. 2006). While this amount is miniscule relative to expenditures in many developed nations, it is double or even triple the combined spending of governments and donors in many of the world's most

impoverished economies. What's more, health is not a government priority in many of these countries, where defense, law and order, and food are of more immediate concern. This means that achieving $34 per capita would require donors such as world governments to dig far deeper into their pockets. While increased funding to save starving orphans and mothers dying of AIDS can motivate funds in the developed world, asking taxpayers to fund comprehensive health systems across the globe while their own systems require resuscitation is a difficult political sell (De Waal 2007).

Even if money were available to fund development of health systems, many countries lack the resources necessary to put such funding to good use. Turning dollars into bricks and mortar and bricks and mortar into health care facilities may be time consuming, but is a relatively easy task. Slightly harder but also doable is turning shoddy demographic and epidemiological data into maps and plans detailing where those bricks and mortar should go. Much more difficult than infrastructure and planning resources is the development of adequate PHC human resources. Health systems require trained health workers and seasoned administrators to function smoothly. High quality primary health care workers are particularly difficult to train, as the nature of their job is that every type of medical problem comes through their door, and they must have the breadth of knowledge to identify the entire spectrum of possible ailments, and the depth of skill to appropriately treat or refer each one. Training these workers takes both time and an assurance that, once time has been invested, such practitioners will have a sure and steady job to support themselves. Such training also requires institutions capable of providing comprehensive primary health care education. Schools of medicine and nursing are often under resourced or simply absent in the developing world. Supporting a health care system therefore requires human resources that are neither readily available nor readily developable in many countries where the need is greatest.

System Dysfunction

Resource constraints tend to force donors' hands into pursuing more focused interventions. However, nearly every country in the world has some form of health

financing system, health governance system, and health infrastructure system, and it is oftentimes a defect in this underlying system that causes the greatest motivation towards circumventing existing institutions.

As shown in figure 2, review of the literature points to several relatively intangible elements of a health system that are necessary for integrated health aid to result in successful health interventions. For example, the health and policymaking workforces must be not only skilled but also motivated in order to deliver effective interventions. Policymaking infrastructure must be flexible enough to adapt to community-level context. Epidemiological information must flow in an accurate and timely fashion, and funding must flow unadulterated to those who need to use it. Unlike resource constraints, an injection of money cannot solve these systemic problems. They are often opaque to outsiders and as a result cannot easily be remedied with well-targeted intervention. Attempting to implement a global health program through a dysfunctional may not only decrease the program's probability of success overall, it could also substantially delay the evidence of success or failure and accumulate significant opportunity costs for donors in the process. As a result, system dysfunction may pose a far stronger motivation towards the establishment of parallel programs than do resource constraints. However, both types of constraints contribute to donors' circumvention of infrastructure, governance, and financing mechanisms.

Classes of Vertical Intervention

Some resource constraints and system dysfunction limit the delivery infrastructure of the country—the physical process by which goods and services are procured, transported, stored, and delivered to patients through clinics and other infrastructure (Infrastructure).[2] As shown in Table 1, other constraints do not limit the delivery infrastructure, but rather the system's ability to govern health care delivery effectively through whatever channels exist (Governance). Finally, some constraints, particularly systemic corruption in public finances, limit the ability of money to flow efficiently

[2] Other investigations divide program types in different ways, for example, separating infrastructure into physical structures, health workforce, supply chain, and health information systems. I feel that in examining broader system effects it is efficient to consolidate these considerations under the heading of "infrastructure" (WHO 2007).

through the system (Financing). Substantial constraints in any of these three categories—Infrastructure, Governance, or Financing—create incentives for donors to build parallel "vertical" programs alongside whatever infrastructure, governance, or financing systems already exist.

	Infrastructure	Governance	Financing
Resource Constraints (potentially solved through financial infusion)	• Absence of appropriate physical facilities • Lack of adequately sized and skilled healthcare workforce	• Lack of management infrastructure, i.e. reporting systems • Lack of adequately sized and skilled policymaking and administrative workforce	• Confiscatory government overhead rates
System Dysfunction (cannot be solved through financial infusion)	• Lack of functional and efficient internal market for healthcare goods and services • Unmotivated healthcare workers	• Unmotivated policymaking and administrative workforce • Inflexible policymaking systems • Political turmoil and lack of continuity in government	• Endemic corruption

Table 1: Examples and classification of resource constraints and system dysfunction that drive verticalization

Parallel Infrastructure

Vertical health programs establish all kinds of parallel infrastructure. To meet donor reporting requirements, many establish parallel health information systems. Many operate unitary supply chains for medicines and supplies. Some hire, train, and deploy their own health workers. Some go as far as to establish their own clinics and hospitals.

Establishment of parallel infrastructure can be justified simply by the fact that parallel infrastructure can be specialized in such a way that it suits the delivery of disease- or intervention-specific care. Health workers can be trained quickly with deep knowledge and well-honed skills in the area of interest, improving the relative effectiveness of lower-skilled health workers (Mills 1983). Bricks and mortar can be placed in areas of the highest demand for particular interventions, and resources can be dedicated to technology specifically well suited for the chosen intervention (Gish 1979) (Mills 1983). Specific and limited sets of metrics make process feedback more timely and effective (Oliveira-Cruz, Kurowski and Mills 2003). More generally, the focus of effort possible when an initiative's goals are well defined and techniques are clear speeds an

organization up the learning curve more readily, achieving maximum intervention impact sooner (Mills 1983) (Atun, Bennett and Duran 2008). Indeed, loss of this focus can undermine already successful initiatives. For example, a shift from focused TB interventions in Zambia to more comprehensive health services caused a detrimental drop in reporting and follow-up (A. Brown 2001).

While the intrinsic benefits in efficiency are important motivators towards vertical programs, the literature suggests that characteristics of the particular system in which the intervention is to take place have as much as, if not more impact on the construction of parallel institutions. The basic level of effectiveness or viability of the system already in place is a commonly identified barrier to integrated delivery. Where bricks and mortar are dilapidated or altogether absent, it is impossible for an organization to provide integrated care (Mills 1983). Similarly, health systems operating at or near capacity cannot absorb new responsibilities or protocols and accommodate new disease-specific goals, nor an influx of patients from epidemics such as HIV (Unger, De Paepe and Green 2003) (Oliveira-Cruz, Kurowski and Mills 2003). Finally, many countries lack the support infrastructure necessary to effectively deliver medical care, such as an assured cold supply-chain in the case of immunizations.

Just as vital to the decision to construct parallel infrastructure are the history and reputation of the health system in question. In health systems such as Kenya's, for example, a history of long wait times, stock-outs, and rude patient care cast a pall over government clinics, substantially reducing the established infrastructure's attractiveness to patients and undermining the effectiveness of interventions undertaken through such clinics. Staff in such systems are often unmotivated and have neither access nor incentive to maintain their medical knowledge and skills through continuing education. This limited motivation also reduces the ability of such staff to absorb new responsibilities (Oliveira-Cruz, Kurowski and Mills 2003) (Commission on Macroeconomics and Health 2002).

Parallel Governance

In some cases, donors may choose to integrate delivery and infrastructure, while maintaining parallel systems of program management and governance. In preserving integrated infrastructure, donors can either take advantage of an adequately functional PHC system, or work to strengthen a health system by providing resources to increase its intrinsic capacity. At the same time, a parallel management and governance system allows a donor to overcome specific obstacles to providing cost-effective health care interventions and to improve control over reporting and accountability mechanisms. Much as parallel infrastructure provides specialized and focused resource deployment, parallel governance allows for deeper expertise in program planning and administration, and indeed, allows for international experts to plan and run programs in multiple countries.

Parallel governance and financing are particularly useful in overcoming deficits in national and local level leadership and management capabilities. Weak management structures in general and within Ministries of Health can slow the deployment of interventions either through managerial incompetence or through misdirection of resources (Conn, Jenkins and Touray 1996). Ministry officials are often overworked and underpaid, and in many cases lack the capacity and expertise necessary to plan or manage a vertical intervention. In addition, the election cycle can wreak havoc on programs whose timeframes extend beyond the 3-5 year election horizon, as the risks of discontinuity that come with frequent management changes are significant enough for donors to justify the establishment of separate governance structures (Oliveira-Cruz, Kurowski and Mills 2003).

Parallel Financing

It is difficult to imagine a tenable situation in which financing is arranged in parallel while infrastructure and governance are integrated into the overall system. However, unique elements of financing make it informative and insightful to separate it out. For example, the overhead rate charged by Ministries of Health can be exorbitant, reportedly eating up 80% or more of donor funding in some cases. More insidious, finances that

flow through government coffers are prone to skimming and the effects of corruption. Therefore, maintaining funding flows in parallel to government financing mechanism reduces the probability that government money will be misdirected.

The impact of vertical programs on health systems

As described above, parallel program implementation has benefits in mitigating both intrinsic factors, such as appropriateness for a goal and time to attributable impact, and also system defects, such as poor infrastructure and an unskilled and unmotivated workforce. In practice, these factors have caused donors to direct most health aid vertically. Combinations of parallel approaches, for example integrated delivery with parallel governance, make up what some have termed the "diagonal poly pill". Still, Laurie Garrett was speaking for a chorus of detractors when she stated that "unless these efforts start tackling public health in general instead of narrow, disease-specific problems—and unless the brain drain from the developing world can be stopped—poor countries could be pushed even further into trouble, in yet another tale of well-intended foreign meddling gone awry," (Garrett 2007).

The literature, including Garrett's incendiary publication in Foreign Affairs, identifies many negative effects of vertical programs and their parallel structure, supported by varying levels of evidence and conjecture. There is certain to be credence underlying each of these hypotheses, and the focus of this report is not to validate their veracity, although some are clearly better supported than others. Rather, in this thesis I seek to explore these collected effects as a dynamic system that influences both the form taken by global health aid, and also the effects such aid dollars have.

Assembling all such effects into a single dataset of causal relationships brings into view several broad systems of impact. In summary, these are:

Specialist care delivery: Specialization through vertical programs is thought to help health workers deliver better care for a given skill level. However, this effect can be

undermined as the range of interventions available to workers is limited and patients are, ultimately, discouraged from seeking care. The result is an unforeseen increase in the incidence of some diseases, and interventions that do not meet patient needs and, as a result, cause long-term disengagement with the health system.

Primary health care delivery: Vertical programs, when run through existing PHC infrastructure, can avoid problems of fragmentation. However, such programs can also reduce the effectiveness of generalist health care providers and actually induce donors to build specialist infrastructure. The end result is a health system comprised of relatively skilled and motivated specialists and mediocre and complacent generalists, further feeding fragmentation of care.

Policymaking: Parallel governance structures take the pressure off of policymakers to develop skills and capabilities necessary to successfully drive a policymaking agenda in the long run. In addition, top-down policies imposed on communities are often ill-suited to circumstances, and have the long-term effect of discouraging individuals from participating in the health care system.

Internal markets for health care: The infusion of money that comes with any form of aid can certainly spur economic activity around the industry for which the aid is distributed. At the same time, parallel programs create large competitors to private industry in health care delivery and even in supporting infrastructure such as the supply chain. A thriving internal health care economy not only increases the likelihood of sustaining a functional health system in the long run, but it also creates political pressure to support the establishment and maintenance of a functional internal health care economy.

Specialist Care Delivery

Several authors identify "fragmentation of care" as a particularly harmful consequence of vertical programs. Under many vertical programs some aspect of infrastructure, whether workers, supplies, or facilities, is specialized to focus on one disease, such as HIV/AIDS, one patient group, such as pregnant women, or one type of intervention, such as immunization. In such cases a population requires multiple specialized programs to meet all of its needs, and the delivery of care to any single patient can be thought of as fragmented. In parsing this literature to identify the causal relationships that authors believe to contribute to this effect, I find the following:

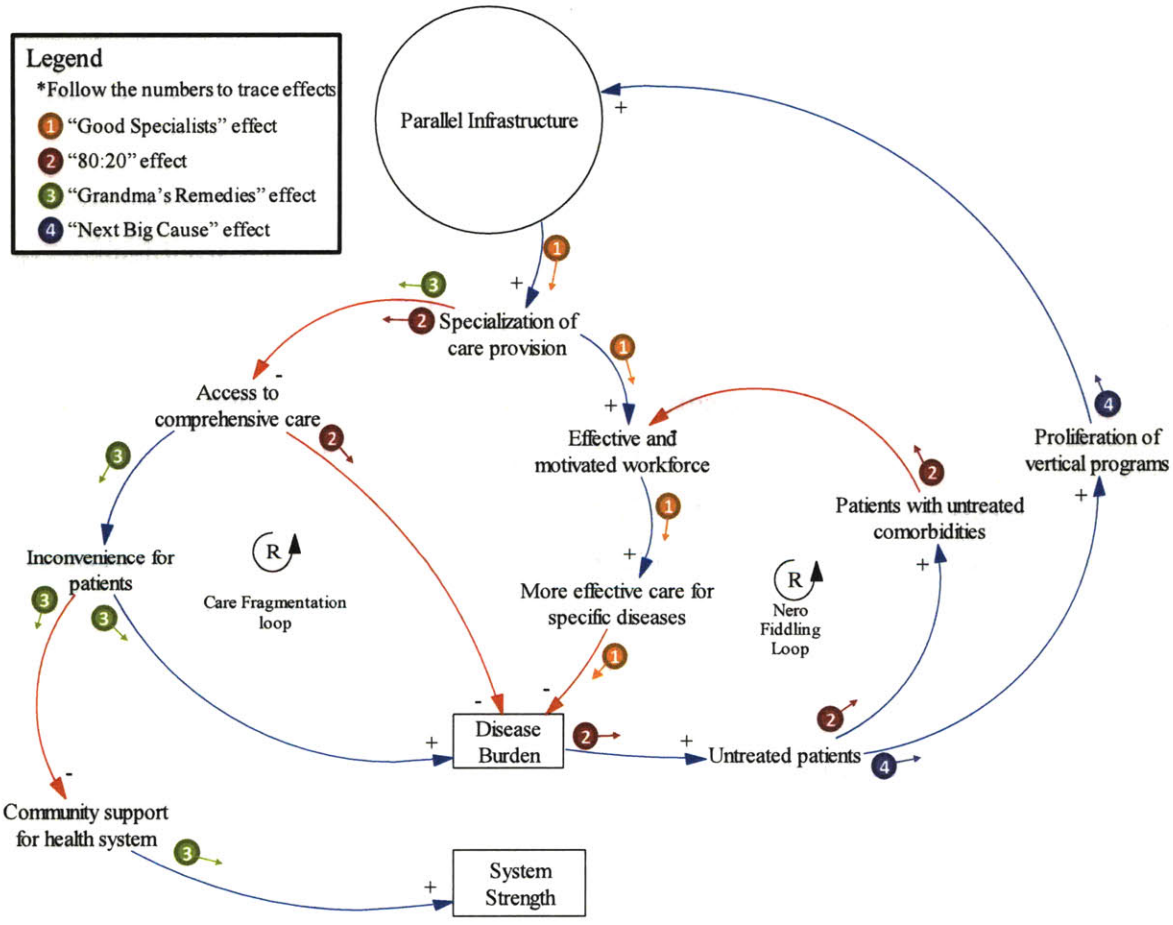


Figure 3: Dynamics of Specialist Health Care Delivery: Fragmentation

1. ***"Good Specialists" effect:*** Specialization of care is undertaken because policymakers believe that for some particular diseases, populations, or interventions, focused resources yield good results in a short period of time. Indeed, specialization increases the relative effectiveness of workers, particularly those of lower-skill levels, as shown by BRAC's community TB workers in Bangladesh (May, Rhatigan and Cash 2008). This relative effectiveness yields highly motivated workers, who deliver high quality care, and decrease the overall disease burden in the country (Oliveira-Cruz, Kurowski and Mills 2003).

   One would expect observers to argue as well that any health worker training, specialized or otherwise, would have an ancillary benefit to the health system's capacity to direct and manage care in the long run. Anecdotal evidence from Rwanda, for example, suggests that training of specialists and their subsequent employment by in-country NGOs prevents the "brain drain" of talented individuals emigrating to find opportunity.[3] However, the targeted literature search performed in this analysis did not uncover either evidence or conjecture of such a relationship.

2. ***"80:20" effect:*** Specialization means that at any given care delivery site the range of interventions available to practitioners and patients is lower than it would be in a primary health care driven system (Unger, De Paepe and Green 2003). This means that patients with co-morbidities or conditions outside the range of services offered by a given specialized caregiver or clinic are more likely to go untreated than they would be in a primary health care driven system—a specialized clinic may treat eighty percent of patients by stocking twenty percent of available drugs (numbers used for illustrative purposes only). In reality, such a clinic may be the only provider within easy walking distance for many patients, and as a result, some patients presenting to specialists may go untreated, undermining the relative effectiveness and motivation of the workforce and, according to one author, even causing workers to drop out of the workforce

[3] Source: Personal interview

(Loevinsohn and al. 2002). In the end, both the increase in disease burden and decrease in worker happiness and motivation reduce the effectiveness of health interventions and may harm the system in the long-term. (Brown, Cueto and Fee 2004).

3. ***"Grandma's Remedies" effect:*** As stated above, specialization means that at any given care delivery site the range of interventions available to practitioners and patients is lower than it would be in a primary health care driven system. To be fair, this does not mean that the overall care capacity in the system is any less, indeed, it would certainly be much higher than it otherwise would have been. The overall care available for any single disease could be the same or higher than at baseline. However, the specialization of deliverers and clinics means that a patient's point of contact will not be able to offer comprehensive services, but may instead refer a patient to other facilities. Referral increases inconvenience as it requires that a patient take more time out of her life to seek treatment incur additional transportation and opportunity costs, increasing the risk of loss to follow-up (Brown, Cueto and Fee 2004). Transportation costs may force patients to choose between two required treatments, as may be the case with pregnant women with HIV/AIDS seeking both anti retroviral and antenatal treatment (Garrett 2007). With HIV/AIDS care, particularly, specialized facilities can exacerbate the stigma carried by the disease, discouraging patients from seeking testing and treatment (Brown, Cueto and Fee 2004).

   In the end, this loss of comprehensive care can yield two major impacts. Untreated diseases or co-morbidities can fester and propagate, or perhaps worse, partially-treated disease can become resistant to therapy (A. Brown 2001). An extreme example of this stems from the multiplicity of disease-specific clinics in much of Eastern Europe, which one author suggests resulted in the world-leading prevalence of multi-drug-resistant tuberculosis in the region (Brown, Cueto and Fee 2004). Secondly, dissatisfaction and frustration with a fragmented health system cause patients to disengage from the health system, returning to

traditional remedies, chemist-prescribers, and private clinics of un-assured quality. Without such community support, the health system cannot sustain itself (Unger, De Paepe and Green 2003).

4. ***"Next Big Cause" effect:*** As co-morbidities propagate or, as one author terms it, "less fashionable" diseases progress while specialized programs focus on other problems, the burden of non-priority diseases may reach a tipping point at which either existing specialized programs must be expanded to treat these other diseases, or new parallel programs must be established (Brown, Cueto and Fee 2004). While this phenomenon represents my own conjecture, it is supported by the literature in that malaria is cited as an example of having been just such an "unfashionable" disease in the 1980s, while today it is one of the "big three" areas of global focus (Travis, Bennett and Haines 2004). Interviews also confirm that this is an observed dynamic.

Nero Fiddling Loop: As illustrated in Figure 3 and in the descriptions of the "80:20" effect, there is a substantial reinforcing loop in this system in which, as patients continue to present with diseases and co-morbidities that are untreatable by the specialists who see them, the relative disease burden increases, further increasing co-morbidities and untreatable diseases.

Fragmentation Loop: As Figure 3 illustrates, one major downfall of this system is that, as the "Nero Fiddling Loop" builds, incentive increases for donors to introduce additional specialized programs to address the rising burden of additional diseases. However, additional vertical programs increase inconvenience for patients, who are then less likely to engage with the system, increasing the disease burden and further increasing the incentive for additional specialized programs.

Primary Health Care Delivery

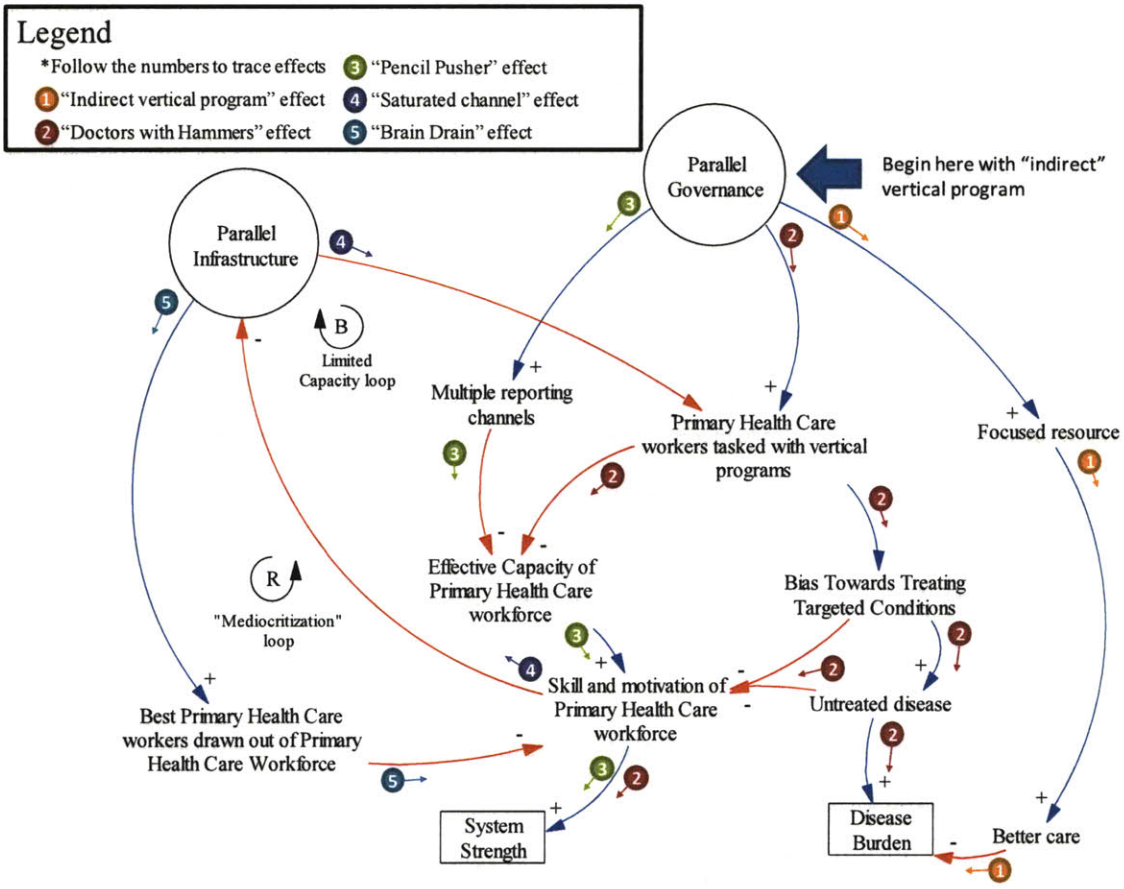


Figure 4: Dynamics of Primary Health Care Delivery: Mediocritization

While many aid programs construct parallel specialized infrastructure, still others work to avoid the problems identified above by delivering care through an existing generalist primary care facilities and workforce. Under these "indirect" vertical programs, donors establish parallel governance systems to which primary health workers then become accountable. However, as parallel governance structures multiply, PHC workers are overwhelmed with paperwork and administrative responsibilities, which when combined with the limited range of services for which supplies are pushed down through the system, decreases the skill, motivation, and effectiveness of PHC workers. As a result, the PHC workforce becomes relatively unattractive to donors who seek impact with their aid, increasing the likelihood that those donors build parallel infrastructure and circumvent the PHC workforce in future interventions. Finally, as

parallel infrastructure proliferates, the best PHC workers are drawn by better pay and working conditions to vertical delivery systems, leaving the PHC workforce staffed by those whom vertical programs found unattractive.

1. ***"Indirect Vertical Program" effect:*** Parallel governance is instituted in order to focus channels of supply, policy planning, and accountability while taking advantage of established health systems. By focusing resources and policy planning, donors are better assured that workers have the supplies and training necessary for targeted interventions, and by focusing reporting channels, can be better assured that care is being delivered as intended. As a result, delivery is more effective than it otherwise would be, and the disease burden is decreased.

2. ***"Doctors with Hammers" (or "Specialized Generalists") effect:*** Ideally, PHC workers tasked with delivering vertical interventions would deliver specialized care alongside general care with no bias, but the fact that vertical interventions have in many cases a better supply chain, focused training, and more stringent reporting requirements than general interventions causes generalists to specialize *de facto* (Unger, De Paepe and Green 2003). As several have observed of the WHO polio eradication initiative, generalist responsibilities are crowded out as workers struggle to meet the vertical goals to which they are more vociferously held accountable (Mogedal and Stenson 2000) (Travis, Bennett and Haines 2004) (Smith and Bryant 1988) (Oliveira-Cruz, Kurowski and Mills 2003).

   Two major effects derive from this *de facto* specialization. First, patients for whom workers have no treatments either go untreated or, perhaps worse, receive whatever medicines have been supplied by vertical programs: just as to the man with a hammer everything looks like a nail, so too, the health worker with Coartem suddenly sees malaria everywhere.[4] This increases the relative disease burden, as in the "Nero Fiddling" loop. Second, generalist health workers delivering specialized care are disempowered by proscriptive intervention

[4] Source: Author's personal experience, corroborated in interviews.

guidelines—are permitted hammers but not saws or drills—which has been observed to de-motivate them, in itself reducing the quality of care received and the viability of delivering vertical programs through primary care (Unger, De Paepe and Green 2003) (Garrett 2007).

This is one of the few areas for which quantitative study has so far been possible. For example, as part of her doctoral dissertation Karen Grepin of Harvard examined the impact of HIV/AIDS programs on non-targeted interventions, specifically routine immunization rates in sub-Saharan Africa. Using data both from the United Nations Children's Fund (UNICEF) and national Demographic and Health Surveys (DHS), Grepin found a correlation between increased HIV/AIDS funding and decreased routine immunization rates, particularly in countries with relatively understaffed health sectors (Grépin 2009)

3. ***"Pencil Pusher" effect:*** As indirect vertical programs proliferate, so do reporting channels. Anecdotes hold that in some cases generalist health workers must file four or five forms for a single patient, and prepare even more reports at the end of each month. In addition, vertical programs often require workers to attend trainings, sometimes two or three per year, which as programs multiply can become a tremendous burden on time and decrease the number of hours available to treat patients. (Travis, Bennett and Haines 2004) (Atun, Bennett and Duran 2008) In adding to frustration and detracting from the time available for patients, the administrative burden of multiple reporting channels further de-motivates the generalist health care workforce, undermining the strength of the system.

4. ***"Saturated channel" effect and Limited Capacity Loop:*** As demonstrated above, the cumulative effect of limited access to interventions ("Doctors with Hammers") and multiple reporting channels ("Pencil Pushers") is to undermine the skills and motivation of the generalist health care workforce. A skilled and motivated workforce is essential in implementing effective "indirect" vertical

programs, and in providing "absorptive capacity," from which future programs can benefit (Oliveira-Cruz, Kurowski and Mills 2003) (Commission for Macroeconomics and Health 2002). It is therefore logical to conclude that future donors would be less likely to pursue indirect vertical interventions, undermining the sustainability of "indirect" programs in the long run.

5. ***"Brain Drain" Effect and "Mediocritization" loop:*** As discussed above, indirect vertical programs can prove to be ultimately unsustainable in the long run, causing donors to establish parallel infrastructure alongside primary health care. In other cases, as with the specialization discussed earlier, donors determine from the outset that parallel programs are ideal. This parallel infrastructure—including parallel workforces operating down the road or even down the hallway from one another—causes a chain of events that extracts the heart—or brain—from the country's generalist workforce. Options for employment proliferate. In order to attract good workers, these new parallel programs generally pay higher wages than the government, and eventually may compete with each other on price to attract the highest skilled and most efficient doctors and nurses. Indeed, evidence from Malawi suggests that the government health ministry has lost 85% of its doctors and 64% of nurses to NGOs, both inside and outside the country. With fewer workers available to deliver primary care, health outcomes decline (Travis, Bennett and Haines 2004).

   The population remaining in primary care is enriched for workers who lack either the skills or motivation to pursue higher paying opportunities. Differentials in pay and in quality of facilities further serve to de-motivate the remaining PHC workforce (Atun, Bennett and Duran 2008). The relative paucity of resources available to these PHC workers makes them feel "more like hospice and mortuary workers than healers," driving more to leave the workforce and the remainder to despair for their situation (Garrett 2007). Worker frustration and lack of motivation manifests specifically as rudeness towards patients, carelessness in care provision, and longer wait times, all of which discourage

patients from seeking care (Unger, De Paepe and Green 2003). In the end, the health system can be left with fragmented silos of vertical programs and a mediocre and unmotivated workforce delivering primary health care.

Policymaking

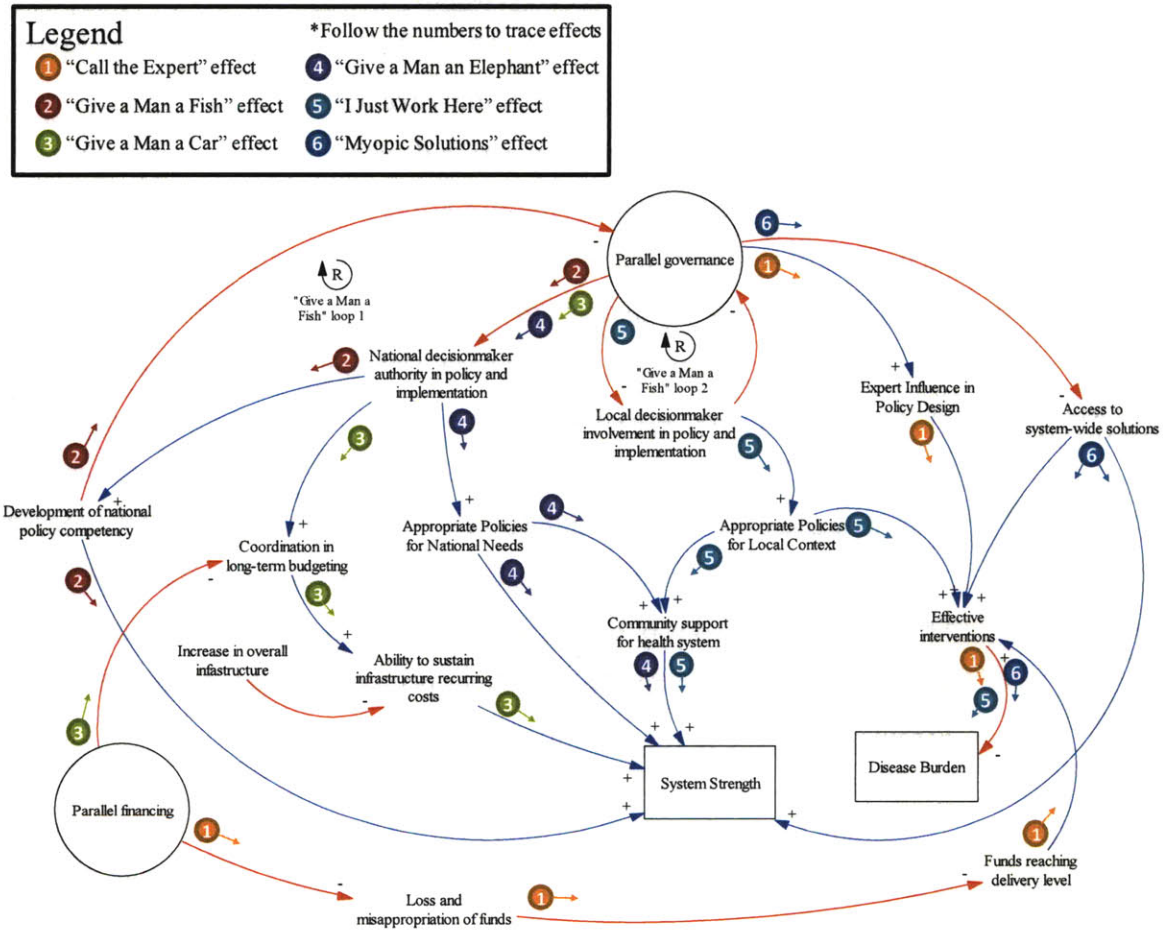


Figure 5: Dynamics of Policymaking: Top-down policies

The effects of vertical programs on a country's underlying policymaking capabilities and infrastructure are certainly complex, but in some ways mirror other major health system impacts. For example, the "brain drain" and "mediocritization" phenomena are commonly observed in the policymaking and health care administration workforce, in

addition to among health workers themselves (A. Brown 2001). In the short-term, the most important element of policymaking is that policies are appropriate and effective in local context. In the long-term, sustainability of a robust health system must be served by building capabilities within the policymaking and administrative workforce. The literature identifies negative impacts of vertical interventions in both of these areas.

1. ***"Call the Expert" effect:*** The nature of vertical interventions, particularly those designed and carried out by experienced NGOs, is such that lessons learned from previous iterations can improve the effectiveness of newly established programs. This is strong incentive for donors to circumvent existing policymaking and governance structures in establishing their own programs. In addition, the development and implementation of such expert advice is expedited by funding such experts and firms directly, rather than operating through existing government financing systems. Presumably parallel governance leads to more effective interventions, and thereby decreases the disease burden.

2. ***"Give a Man a Fish" Effect and Loops:*** Parallel governance absolves a government of setting many policies and solving many problems for which it would otherwise be held accountable, substantially reducing the "learning by doing" effects which can build long-term system capacity (Brautigam and Knack 2004). For example, a robust PEPFAR AIDS intervention strategy, even if it is ostensibly coordinated with government ministries, absolves those ministers of solving the very real and technical problems which come with procuring and distributing testing and therapeutic materials. As a result, policymakers and administrators fail to develop the capacity to improve their own health care services, which not only undermines the long-term strength of the national health system (A. Brown 2001), but also decreases the likelihood that future donors will work through the ministry in designing and implementing their own programs.

3. ***"Give a Man a Car" effect:*** When parallel infrastructure is created, it generally comes with a funding stream along with it. Stories abound of costly medical

equipment sitting unused in African hospitals for wont of spare parts and the money with which to procure them. Observers note similar effects on a system-wide scale, with warehouses, clinics, even whole hospitals crumbling as donors have moved onto to other projects. Just as providing someone with a car is useless if the recipient cannot afford fuel and insurance, so too does the long-term sustainability of additional infrastructure and system investment depend upon the recipient's ability to cover recurring costs (Mills 1983).

4. ***"Give a Man an Elephant" effect:*** Top-down policymaking is certainly not unique to health programs, nor to the developed world, but it can have detrimental impacts on not only the effectiveness of vertical programs but also the strength of the health system in which it occurs. The solutions imposed by policymakers in the national capital, Geneva or New York, are often not well-suited to local circumstances, decreasing their utility to patients and reducing the impact that vertical programs may have on disease burden (Brown, Cueto and Fee 2004). This problem is exacerbated by the observation that, when policymakers become beholden to donors rather than the citizenry for their budgets, they shift policies to meet the needs of those donors rather than the true needs of the citizens (Reinikka 2008). In addition, such programs often do not match with the country's needs as perceived by its Ministry of Health, and when aid is withdrawn many are simply abandoned. Perhaps more detrimental, interventions that turn out to be inappropriate or ill-designed at the local level weaken overall community support for the health system (Unger, De Paepe and Green 2003).

5. ***"I Just Work Here" effect:*** Atrophy of policymaking capabilities may be even more pronounced at the local level, as the effect of parallel governance is compounded by a top-down policymaking approach to breed passivity and complacency in local policymakers. Several authors suggest that parallel governance in most cases leads to a top-down policymaking approach whereby communities are treated as passive aid recipients, rather than active partners

(Brown, Cueto and Fee 2004). In many cases, policymakers do not even share responsibility for implementation. The lack of ownership and investment in such aid greatly reduces policymakers' sense of mission and with it the probability that its effects will persist after donors leave (Birdsall 2004). And in the end, a multiplicity of reporting channels makes local coordinated policy planning and initiative difficult to sustain (Brown, Cueto and Fee 2004), discouraging entrepreneurial and self-motivated individuals from joining the local policymaking workforce.

6. ***"Myopic Solutions" effect:*** Verticalization, while it focuses resources and expertise on specific areas, can also exclude cross-cutting solutions for problems across multiple areas. One common example of this is the struggle to build comprehensive and effective health information systems across national health sectors. Individual donors and program administrators have specific requirements that must be met in order for resources to be accessed, which leaves local policymakers in the unenviable position of either reconciling many different standards and pooling money from different sources, or supporting the implementation of many different siloed systems which, in the long run, are not of as much benefit to the system.

Internal Healthcare Economy

In conducting the literature search element of this project, I expected to find writers commonly commenting on the development and distortion of internal private health care economies which naturally comes with millions of dollars in targeted external aid. Surprisingly, in all of the authoritative articles reviewed, only Garrett (2007) commented on market distortions, suggesting that NGOs implementing vertical programs recruit talented individuals who might otherwise pursue private entrepreneurship, and also that the sheer scale of NGOs implementing vertical programs crowds out local innovation. To be fair, these impacts could just as easily come from NGOs engaged in health systems strengthening as from vertical programs. Even still, "It is curious," says Garrett, "that even the most ardent capitalist nations funnel few if any

resources toward local industries and profit centers related to health. Ministries of Health in poor countries face increasing competition from NGOs and relief agencies but almost none from their local private sectors. This should be troubling, because if no locals can profit legitimately from any aspect of health care, it is unlikely that poor countries will ever be able to escape dependency on foreign aid," (Garrett 2007). More curious still is the lack of attention paid to such effects by the global health community, particularly given rising attention paid to "micro-entrepreneurship."

To provide a jumping-off point for others exploring these issues in the future, I have laid out a system dynamics framework to capture the potential impact of vertical programs on internal markets.

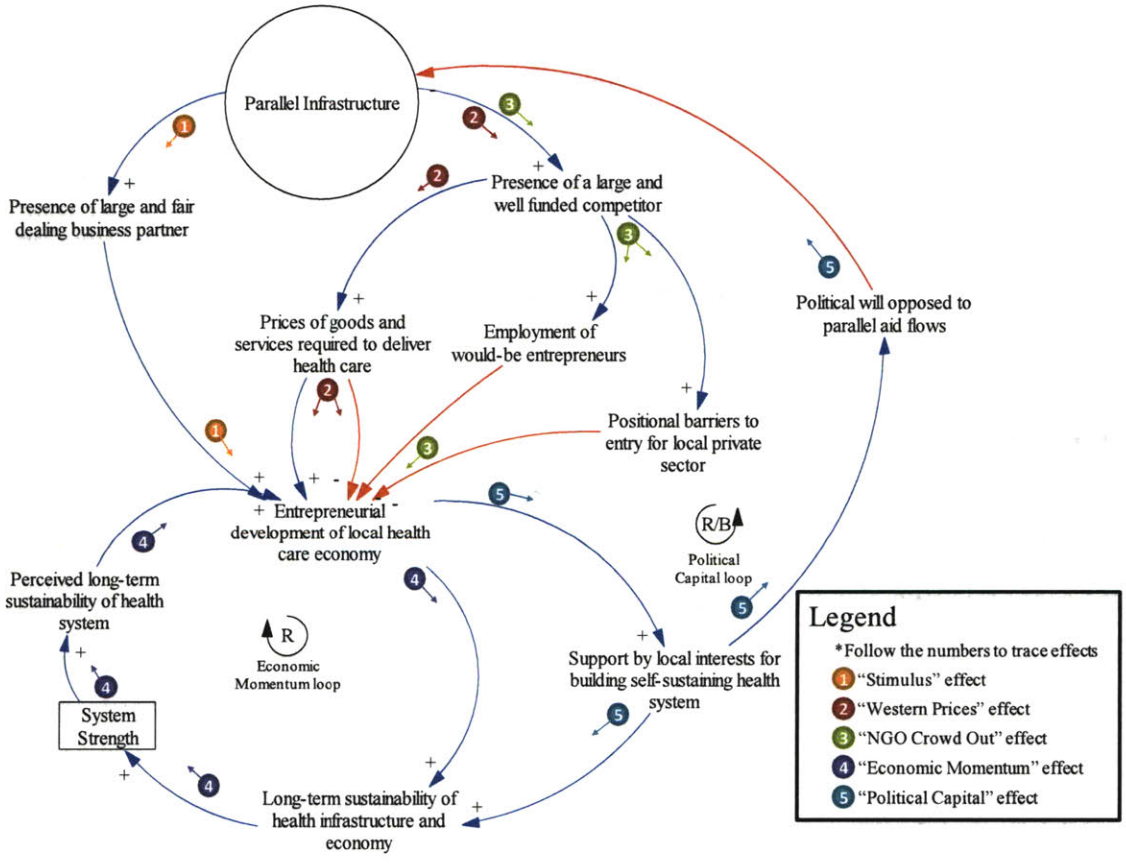


Figure 6: Dynamics of Internal Healthcare Economy: Distortion and Opportunity

1. ***"Stimulus" Effect:*** Ideally, donor-funded NGOs enter an economy as a business in search of partners to help them achieve their goals. They engage local businesses in a number of ways, retaining the local service industry such as accountants and lawyers in helping set up operations, employing internal logistics operators to aid with supply chain, and demonstrating to local businesses and entrepreneurs that there is money to be made by serving the health care industry. As a result, more entrepreneurs and established businesses begin to serve the health care economy, and more of the donor funds made available for intervention are captured by local businesses.

   Donors to a limited degree have sought to feed this stimulus effect through program design. The GFATM Global Management Solutions mechanism, for example, is designed to engage local management service providers such as accountants and computer experts in helping to implement GFATM grants, and has shown some success in drawing local consultants into the health care economy.[5] More often than not, however, donors and program implementers utilize their own experts for such technical assistance, muting any stimulus effect. In other cases, donor funds flowing through established elements of the local health care economy help those institutions build scale and scope which can serve other clients as well. In Kenya, for example, PEPFAR utilizes the pre-existing MEDS drug distribution chain, and its investment has allowed MEDS to broaden the range of drugs it offers to all customers.

2. ***"Western Prices" effect:*** The presence of a large and well-funded entity can have both positive and negative effects on the health care economy. Such entities increase demand for certain goods and contrary to what classical economics would anticipate of an entity with substantial buyer power, tend to pay well above the prevailing prices, pushing prices and margins higher. As a result, involvement in the health care economy is more attractive to local entrepreneurs.

[5] Source: Personal interview.

At the same time, if NGOs require services on a large scale, entrepreneurs might be disfavored relative to established players.

The effect of foreign aid on prices is widely discussed in the general development literature, and it is certainly worth considering when designing health interventions (White 1992).

3. ***"NGO Crowd Out" effect:*** NGOs enter an economy on an enormous scale, often doubling or tripling the amount of money in a local health care industry. Not only do they drive up input prices, but they also drive up wages. In a typical example, Roger England writes that his driver in Malawi earns a higher salary than the Minister of Health (England 2008). In such cases, highly capable individuals who might otherwise start businesses in the health care economy instead find employment with the NGO to be a better option, stifling long-term economic development (Garrett 2007).

   In addition, large NGOs present a formidable barrier to potential entrants in competing for donor and government funding, and also in reaching patients. Aid contracts are a political game, and the positional advantage posed by an NGO with the right Ministry and donor contacts can prove insurmountable for would-be entrants. In addition, health care infrastructure is generally built to a capacity which closely matches the community's size and needs. An entrant's clinic would therefore represent overcapacity, and drawing patients at an efficient scale could prove very challenging.

4. ***"Economic Momentum" effect and loop:*** Entrepreneurial energy and the development of scale in a local health care economy represents a reinforcing cycle. Such energy not only builds long-term sustainable physical capacity in the health system, it also builds community support for building such a system. As the system begins to look stronger, ventures in the health care economy begin to

look less risky, drawing more capital and more entrepreneurs into the local health care economy and further increasing long-term sustainability.

5. ***"Political Capital" effect and loop:*** As community support builds for the local health care economy, political will builds within government to take more control of donor funds and direct them to the burgeoning economy, rather than allowing NGOs to build around it. Although factors such as strong national leadership, in the case of Rwanda, and the broader environment of aid mechanisms, as in SWAp countries, may have more influence over such a decision, it is reasonable to suggest that political will driven by a strong local health care economy could provide the political capital necessary for leaders to take a bold stand with donors.

Summary of Literature Review

In summary, the literature points to several dynamic effects which, taken together, define the system of interactions among vertical programs and health systems. These dynamics are:

- Fragmentation of Care
  - "Good Specialists" effect
  - "80:20" effect
  - "Grandma's Remedies" effect
  - "Next Big Cause" effect
- "Mediocritization" of Care
  - "Indirect Vertical Program" effect
  - "Doctors with Hammers" effect
  - "Pencil Pusher" effect
  - "Saturated channel" effect
  - "Brain Drain and Mediocritization" effect
- Top-down Policymaking
  - "Call the Experts" effect
  - "Give a Man a Fish" effect
  - "Give a Man a Car" effect
  - "Give a Man an Elephant" effect
  - "I Just Work Here" effect

- Distortions in Markets
    - "Stimulus" effect
    - "Western Prices" effect
    - "NGO Crowd Out" effect
    - "Economic Momentum" effect
    - "Political Capital" effect

I am cognizant of and indeed comfortable with the fact that the literature review above is not exhaustive and possibly not representative of the breadth of thinking and observation that has been done on this topic. To assure that the universe of impacts identified is as comprehensive as possible and represents the prevailing mental model in the field, I asked ten experts representing an array of institutions and having wide-ranging experience to identify the major impacts of vertical interventions on health systems. Each of the effects mentioned by experts (including, interestingly, market impacts) had been previously identified in the literature review detailed above, validating those results.

Chapter 5: Analysis as informed by interviews

General findings

The experts interviewed for this work represented a balance of field experience and higher level academic involvement, of having worked in vertical programs and for improvement of health systems in general, and of being relatively new to the field and having built some of the most established institutions within global health. These experts included one representative of a large Global Health Intervention (GHI) donor, three expert academics with field and policy experience, the chief executive of one of the world's largest implementers of global health programs, three leaders of delivery-oriented NGOs, and two individuals who have been investigating these issues in the field through interviews with stakeholders in several developing countries. In addition, I conducted formal and informal interviews with patients and practitioners while working in the Kenyan health sector for four weeks. I was not able to secure interviews at several important organizations, such as the World Health Organization, PEPFAR, or DFID, in the compressed timeframe during which interviews occurred. Nor did I interview representatives of Ministries of Health, which could potentially bias these results towards the viewpoint of NGO implementers. However, I look forward to receiving comments from such individuals and revising my conclusions over time.

While each interviewee brought a unique perspective to the table, I anticipated that most would agree that certain effects identified above tend to determine the net effect of vertical interventions on health systems. Interestingly, support was found for nearly all of the effects identified above. Experts did concur, however, that certain elements of the contemporary global health context were very important in driving these systems in one direction or another, as is detailed below.

Identification of key dynamics

The effects collected in the diagrams above derive from observations made over two or three decades, in dozens of countries, and of programs of all shapes and sizes. I expected that, when today's experts were asked about the most important dynamics in

today's environment a few common failure modes or "stories" would emerge as the most relevant to today's aid environment. Interestingly, each expert did, indeed, identify several such dynamics as the most important, but the overlap among these views was relatively minimal.

Brain drain was a common complaint, but when probed, some experts attributed brain drain primarily to salary effects ("Mediocritization"), some to "Pencil Pushing," and some to de-motivation resulting from untreatable co-morbidities ("Doctors with Hammers"). Most experts identified with the reinforcing feedback loop created when overloaded PHC workers begin leaving for vertical NGOs, leaving more mediocre workers in the PHC system, and further creating incentives for vertical NGO implementation, suggesting in one case that it presented an example of what countries like Kenya are fighting against as we speak.

Community engagement and involvement in the healthcare system was another commonly identified area of vertical program impact on health systems. Most experts noted that vertical programs, when done right, can increase overall community involvement and create spillover into non-targeted areas. As one hyperbolically put it, "the bar is so low in many places that a smile and handshake can remake a patient's view of the health system." At the same time, experts did see vertical programs, particularly in HIV/AIDS distribution, as creating inconvenience for patients. "NGOs tend to underestimate the opportunity cost felt by patients," when they need to travel and seek treatment from multiple locations, noted one expert.

Policy shift or displacement was another common complaint, and at the root of all expert objections to top-down policymaking was buy-in and continuity. All experts agreed that parallel governance allows and indeed encourages policymakers to shift their focus elsewhere. It is the rare example to find a country such as Rwanda refusing aid if it comes with "policymakers attached". Interestingly, some experts found the greatest policy problems at the ministry level, where concerns about perpetuating programs following donor withdrawal were felt to drive dependence on aid. Others found local policy planning involvement to be the most important policy dynamic, because

regardless of the source of funds, programs poorly designed for local context can discourage participation in healthcare more broadly while raising the same continuity concerns.

Only two of the experts interviewed brought up market concerns without prompting. Those who did suggested that having a "big gorilla" in the market distorted prices and wages for other players. Interestingly, both also noted that substantial market building opportunities are routinely lost because these NGOs typically bring in outsiders to provide services which local contractors could otherwise provide such as transportation, computer and technical assistance, and even clerical support.

Other experts, when prompted, similarly focused on negative market impacts, such as crowd out of potential competitors and "sucking the energy" out of local would-be entrepreneurs by either presenting substantial positional barriers through relationships with funders and the government, or by literally sucking-up the entrepreneurs themselves into program management roles. While one expert was hopeful that these entrepreneurs would then be armed with tools to build their own health care organizations following an apprenticeship with the NGO, no expert pointed to an example when this had actually occurred.

Differentiating factors

Today's global health aid environment is dominated by two new and glaring contextual facts. The first is that HIV/AIDS has changed the game: whereas previous programs have focused on relatively acute interventions such as immunization or malaria treatment, HIV is a chronic disease, and interventions must last for life. Malaria, as a disease of prevention and acute treatment, raises a very different set of concerns. The second important contextual fact is that a small handful of global players dominate the aid world, and their specific policies map closely to several of the impacts identified above. Understanding these two key dynamics allows one to understand far better which of the potentially negative dynamics listed above are likely to dominate in any given circumstance.

Disease Effects

HIV/AIDS changed the game. Not only did the disease mobilize an unprecedented degree of resources for global health delivery, it did so for treatments that are fundamentally different from the mass immunization, maternal and child health, malaria treatment and many other interventions before it. HIV is a primary care disease. According to one interviewee, "[HIV/AIDS] is the quintessence of a clinical, individual, personal health service on the treatment side. There is nothing 'mass' about it at all—individual docs dealing with individual patients with individual needs." When treated properly it is a chronic condition like diabetes, heart disease, asthma, and the host of other conditions which are managed chronically rather than treated acutely. HIV also impacts the immune system, which complicates nearly every health care incident in a person's life. This means that HIV patients must have access to caregivers with both specialized knowledge of their particular disease, and also the generalist knowledge required to treat the daily morbidities of living life like everybody else.

HIV/AIDS Impact on Specialization Dynamics

The chronic nature of HIV/AIDS has serious consequences when overlaid on the systems described above. As HIV is a lifetime disease, it must be managed close to home rather than in large-scale specialized facilities. Since HIV patients have complex needs, their care providers must be highly skilled and motivated to find the right treatment for the right patient. These requirements make a Specialist Care Delivery model such as that described in Figure 3 appear highly inappropriate. Care in this model is fragmented by necessity of specialist care provision, and unable to address the myriad co-morbidities suffered by HIV patients. Specialization of HIV facilities has been shown to add to the disease's stigma in communities, discouraging individuals from seeking diagnosis and treatment. While the inconvenience of specialized facilities may be bearable for patients seeking the odd STD test or infrequent immunization, for an HIV patient to not have access to comprehensive care at his or her primary point of health care presents a substantial barrier to care, and could undermine confidence and faith in the entire health system.

HIV/AIDS Impact on Generalist Dynamics

Parallel governance has surely helped to focus resources, training, and monitoring to help put aid dollars to good use in testing and treating HIV patients. The global scale-up in treatment over the past eight years has been nothing short of astounding, although millions of Africans still lack access to Anti-Retroviral therapies (ARVs). Many programs have attempted to integrate HIV/AIDS treatment with primary health care, circumventing the fragmentation effects of fully specialized care. Crucial to the success of such programs is maintaining a motivated and skilled generalist health workforce even as they focus at times on particular conditions, and doing so has proven to be a challenge in some cases.

Interviewees note that the dynamics of multiple reporting channels ("Pencil Pusher" effect) and inadvertent specialization ("Doctors with Hammers" effect) have proven to be particularly important and challenging in the context of HIV/AIDS programs. In many countries, HIV/AIDS funds are obtained from multiple donors, each of which has its own metrics and reporting mechanisms to which generalist health providers much conform in order for funding to continue flowing. In order to avoid the loss of highly skilled workers to roles with less complex disease-focused NGOs, it is crucial that NGOs providing not only HIV/AIDS programs but also other integrated interventions harmonize reporting and mitigate the administrative burden falling on health care workers today.

The *de facto* "specialization" of generalist care has been widely observed in the context of chronic HIV/AIDS care delivery through the PHC workforce, and can have substantial negative impacts on health systems. It has been observed that in Zambia, for instance, "top-ups" designed to compensate PHC workers for the added burden of treating HIV/AIDS actually shift workers' focus towards treating HIV/AIDS patients at the expense of others (Oomman, Bernstein and Rosenzweig 2008). Similar effects have been observed with HIV/AIDS-focused training, and investigations are currently underway to understand such impacts in greater depth. Donors must keep in mind, when designing programs, that the risk they run when encouraging de facto

specialization through training and top-ups is that workers will lose their generalist focus and armamentarium, and along with it their ability to identify and adequately treat co-morbidities. As shown in Figure 4, the net result is "*de jure*" specialization and the undermining of the PHC infrastructure so crucial to successful long-term HIV/AIDS treatment.

It is also worth noting that as treatment modalities change, particularly as rapid diagnostics for a host of diseases come on the market, the potential for health workers to deliver high quality generalist care will increase substantially. With the ability to easily segment patients—for example differentiating syphilis from malaria—far more patients will be able to receive the proper treatment. The danger of the factors which drive *de facto* specialization, however, is that health workers will be trained to use these technologies to stratify patient populations within a disease group—for example identifying drug resistant strains of malaria and TB for alternative treatments—but that training and tests to more accurately deliver generalist care will not be made available. Such training and tools can only be made available by putting resources behind more comprehensive training and delivery.

Donor Effects

Whereas the particular features of HIV/AIDS seem to drive specific dynamics in care delivery and the health workforce, the peculiarities of particular donors and NGO partners most directly impacts the policymaking and market dynamics laid out in chapter 4. The past ten years have seen two major entities emerge in the global health world—the Global Fund to Fight AIDS, Tuberculosis, and Malaria, which currently spends approximately $2-3 billion annually to combat those three major diseases, and the President's Emergency Plan For Aids Relief, which spends more than $3 billion annually, although specific numbers are hard to come by. Together these two programs account for more than 40% of all global health spending annually. It is nearly impossible for a Ministry of Health to refuse such large infusions of aid, despite a variety or restrictions attached to each program. Moreover, the manner of planning and aid distribution for each shapes the systemic impact of programs funded by these donors.

PEPFAR and Global Fund Policy Impact

PEPFAR and the Global Fund take markedly different approaches to interfacing with nations' internal policymaking apparatus. Granted, such interface is perhaps as much a function of the personalities involved as it is of each donor's established manner of doing business. However, the Global Fund from the beginning has sought to work *with* national policymakers in formulating plans for intervention. While they cited frequent criticism for the bureaucratic steps necessary for policymakers to translate national AIDS control plans into Global Fund-eligible grants, interviewees suggest that a sea-change is underway which will more seamlessly integrate GFATM grants with national policymaking processes.

Interviewees suggest two major impacts to GFATM's approach to policymaking. First, and perhaps obvious, because GFATM's funds flow through ministry channels, they are subject to overhead charges, leakage and corruption. "We are very lucky to see twenty-cents on the dollar of Global Fund money," according to the director of a major African NGO. The second impact identified by interviewees, however, is that by engaging national policymakers in planning and implementation many of the negative consequences of "giving a man a fish" and "giving a man a car" can be avoided, as policymakers are engaged in policymaking and can even slot implementation and transition into national budgets. However, examining these dynamics in greater detail reveals a danger to long-term system sustainability. Interviewees note that when GFATM money or other donor funds flow through health ministries, the officials who have access to such money often carry inordinate power within Ministries of Health. They draw talented ministry officials into the orbit of HIV/AIDS or malaria programs even when their skills could be better used elsewhere. Even worse these ministry officials find themselves serving donors rather than their political electorate, so rather than showing responsiveness to conditions within the country policies become responsive to the priorities of donors.

The skewed policies which result from such distortions could easily feed into the "Give a Man an Elephant" effect, described above, undermining the long-term sustainability of

the initiative and perhaps more insidiously spoiling the community for future interventions. The very fact that GFATM is now accepting national HIV/AIDS intervention plans in place of GFATM grant applications does nothing to mitigate this effect, as it is very possible that in any given country the energy put into constructing such a plan would be better spent from an epidemiological perspective on building routine immunization, clean water, or maternal and child health strategies. What's more, with policymakers' eyes and ears tuned to the needs of donors rather than the needs of communities, local policymakers have few options available for affecting policy change, which drives the "I Just Work Here" phenomenon and undermines long-term sustainability of the health system.

PEPFAR shows far different impacts on nations' policymaking apparatus. Most PEPFAR programs are designed and implemented with little or no consultation with national health ministries. As a result, interviewees identified all of the problems of the "Give a Man a Fish", "Give a Man a Car," and "Give a Man an Elephant" effects as, in the words of someone with extensive field and academic experience, "PEPFAR's greatest failing". But while PEPFAR has also traditionally been seen as highly proscriptive and top-down in its policies and programs, anecdotal reports from the past few years suggest a more flexible and even locally-driven approach may be taking hold. Several interviewees suggested that, despite stringent reporting requirements, PEPFAR will now tolerate use of its funds outside of the traditional area of HIV/AIDS focused prevention (abstinence-only programs) and treatment (ARV delivery). Such de facto support for health systems was enacted into law through the Congressional reauthorization of PEPFAR in 2008, although it is unclear what form such support will take. What's more, PEPFAR is also now reportedly more open to applications from smaller NGOs who are "closer to the situation on the ground," and presumably therefore more likely to engage local policymakers and fit solutions more appropriately to local context. So while at the national level PEPFAR may fall victim to all of the major detrimental impacts of parallel governance, at the local level, they may prove more amenable to good policy than it might first appear.

PEPFAR and Global Fund Market Impact

PEPFAR and GFATM, which in some countries outspends the Ministry of Health, have clear impacts on markets. Unfortunately, these impacts are at this point very poorly understood. However, interviewees point to a few key dynamics as being typical of each plan's general impact.

PEPFAR, the UK's DFID, and other bilateral agencies can pump tens of millions of dollars into nations' economies in implementing a global health intervention, but the evidence indicates that relatively little of that aid trickles through to the health care and related service economy it intends to serve. One study, conducted by the Center for Global Development, suggested that only approximately 30 percent of PEPFAR money is granted to local partners, with 70 percent passing through the hands of various international partners such as John Snow International, or in the case of DFID the Crown Agents approximately 16 percent of which is then sub-contracted to local parties. While this may be understandable when it pays for international consultants whose expertise may be unmatched domestically, in reality a good deal of this money is put towards procurement abroad of goods available domestically and towards commodity services such as transportation and logistics.

While PEPFAR appears to miss substantial opportunities to engage the local private sector as a business partner in supplying inputs and services, the Global Fund has come under criticism recently for failing to engage private sector players such as pharmacies and private clinics as partners in bringing safe and effective treatment to patients. This has been most apparent with regard to current first-line artemisinin combination malaria treatments. Since the development and 2006 release of Coartem, the first of these therapies, GFATM and the WHO have been supplying doses at marginal cost, approximately $1, to any government that requires it, but not to any private sector distributors. These drugs are then distributed through government mechanisms with abysmal efficiency, according to interviews. Private sector distributors can obtain the drugs, but only at $4 per dose, which prices them far out of reach of most consumers who need them (McNeil 2009). As a result, private sector providers such as pharmacies

and clinics cannot offer the globally accepted first-line malaria treatment, and instead offer older less effective drugs such as quinine, or even worse, non-combination artemisinin derivatives, which risk building disease resistance in the population (Bate 2008).

Today, the Global Fund and others are attempting to ameliorate the malaria drug situation by extending the $1 price to some private sector providers and actually subsidizing the treatments up to 95% of cost. As shown in Figure 6, elimination of price disparities between public and private sector delivery institutions can break down barriers to development of a healthy private healthcare economy. However, this failure to engage otherwise capable healthcare providers is not a limited incident. GFATM and its implementation partnerships such as Roll Back Malaria have come under criticism in the past for simply ignoring local health care economies in planning and implementing programs. According to a 2006 external evaluation of Roll Back Malaria, The External Evaluation Team found that 'private sector collaboration', to RBM officials, implied partnerships with large corporations such as ExxonMobil, as opposed to partnerships and indeed supplier-customer relationships with the smaller domestic private sector. According to the evaluation "This emphasis overlooks an equally important role of the private sector in small-scale production and service delivery at the country level," (Roll Back Malaria External Evaluation 2006). While this approach may not explicitly distort domestic markets, it certainly misses a substantial opportunity to leverage GHIs to develop sustainable domestic health care economies.

Chapter 6: The Story of Kenya

The systems diagrammed above are not only useful in understanding the general problems faced by policymakers in establishing systems of health aid delivery, they are also useful in understanding key points of difficulty or leverage within a given health system. In order to test this notion, two experts with substantial knowledge of the Kenyan health system and history of aid were interviewed in order to determine which effects are most relevant in the country, and what key barriers may stand in the way of successful implementation of aid in the future. In addition, the author drew on past experience studying health delivery in Western Kenya. Drawing from those interviews and the author's own experience, a set of effects in potential need of mitigation was constructed, and qualitatively compared with current donor and government interventional priority.

Workforce impact in Kenya

Experts agree that specialization and fragmentation of health care in Kenya is not a substantial barrier to access, because at the site of delivery care is not so fragmented as to drastically impact patient care and behavior. Some of these programs, such as USAID's AIDS, Population, and Health Integrated Assistance (APHIA), were intentionally designed to integrate at least some activities, in APHIA's case HIV, TB, and family planning services. While an HIV patient in a rural village may need to travel one day out of every two months to have CD4+ cell counts read and ARVs adjusted, in most cases health workers who are "verticalized" by different programs are co-located and able to treat a variety of illnesses.

However, it is often the case that a clinic will have drugs for NGO-targeted conditions, but will not have drugs readily available for less common diseases. This effect is due not to a lack of inventory capacity, but rather, to the sourcing of drugs through several different supply chains. Clinics obtain NGO-supported drugs through MEDS, an NGO-run secure drug distributor in Kenya with a good track record of efficient on-time drug

delivery. Most primary health care clinics, however, obtain the majority of their drugs through the government-run KEMSA, a supply-driven distributor which rather than taking orders, deposits an assortment of drugs at government clinics at roughly 2-4 month intervals. Largely due to PEPFAR's investment in ARV distribution, MEDS is now offering a broader arrays of drugs. The fact remains, however, that PHC deliverers very often lack the proper drugs, even for common diseases such as Malaria, while the vertical care deliverers next door are nearly always fully stocked.

The hypothesis identified in the literature is that lack of ability to treat co-morbidities demoralizes health workers, causes them to become less effective in their jobs ("80:20" effect and "Doctors with Hammers" effect), drives the best workers to NGOs and leaves the remaining workforce as an amalgam of relatively ineffective and unmotivated workers. In interviews with the director of one of Kenya's most successful health care delivery NGOs, with healthcare workers at government and NGO-operated facilities, and with a researcher with extensive knowledge of Kenya's healthcare delivery system, this exact dynamic is borne out. The NGO director, whose HIV/AIDS clinics are in most cases co-located with government PHC clinics, is considering an expansion of his own organization into primary health care delivery because of the demoralizing effect his co-located facility has on its PHC neighbors.

> "[The PHC doctors and nurses] see my staff delivering the right drugs to the right people in well appointed facilities, smiling and making people healthy, while they themselves must consistently refer patients down to the local chemist because drugs simply aren't available. The morale over there is terrible, and it's reflected in the way they treat their patients."
>
> -Director of HIV/AIDS delivery NGO in Kenya

PHC workers themselves echo this dynamic, and add that patients quickly become frustrated when they see their neighbors receiving treatment for HIV/AIDS or malaria while they can't find routine treatment for gout or typhoid. While these workers acknowledge unbidden that they are glad that such care has arrived in the community, they do so while at the same time lamenting that they cannot treat patients as they

would like to. Patients themselves find the PHC workers in government clinics far ruder than NGO workers, wait times unacceptably long, and the probability that they'll receive the proper treatment low enough that many find PHC simply not worth it. Unable to trust the health system, patients end up visiting the local chemist or herbal healer for their primary care, increasing the level of untreated and mis-treated disease in the community ("Grandma's Remedies" effect).

It is difficult to determine empirically whether the workforce dynamics discussed above directly undermine the impact of vertical care by increasing co-morbidity and as a consequence decreasing worker motivation. Many HIV/AIDS programs—the predominant vertical delivery programs in Kenya—have likely not yet been in place long enough to see such dynamics play out. The fact that at least one large vertical deliverer is considering shifting towards a PHC model does suggest some negative feedback. The negative impact of such programs on the health system is clear, however, despite their tremendous success in saving hundreds of thousands of lives through ARV distribution. It is this negative impact that the NGO director is seeking to avoid in his community.

The above effects are all the result of vertical programs carried out through parallel infrastructure, discussed earlier as the specialist care delivery system. However, most of Kenya's vertically-oriented health care is actually integrated at the point of delivery, with a single health worker oftentimes delivering immunizations, distributing bed nets, and providing voluntary HIV/AIDS counseling and testing on behalf of different donors. This is a classic example of the "indirect" vertical delivery noted by Unger and detailed in the "Generalist Care Delivery" discussion in chapter 4. Many of the dynamics identified in that discussion were also identified in interviews as dynamics in evidence on the ground in Kenya.

The literature hypothesizes that "indirect" vertical programs, with their focused supply chains and trainings, provide workers with relatively limited "kits" of interventions, and as a result, they reduce the overall range of interventions available to patients. While at the macro level data suggests that HIV/AIDS funding may have had a marginal crowd-out effect on other health aid (England 2008), in Kenya, evidence and anecdotes

suggesting that vertical drugs and supplies have come at the expense of primary care supplies are relatively absent. Indeed, PEPFAR's strong presence is said to have strengthened and broadened one of the major drug supply chains within the country. While it is possible that concentrated training in specific diseases or having specific treatments ready at hand may alter medical decision-making patterns and bias workers towards diagnosing illnesses for which they have remedies readily available, there is nothing to suggest that this is widespread in Kenya. I conclude, therefore, that the "Doctors with Hammers" effect, with its potential to increase disease burden and de-skill health workers, is currently not a major impact of indirect vertical interventions on the underlying disease burden and health system in Kenya.

On the other hand, the "Pencil Pusher" effect is called out by experts as one of the single most detrimental impacts on healthcare delivery within the system. The burden of multiple reporting channels is a substantial drain on health worker time, energy, and motivation. PEPFAR, one of the largest health donors in the country, requires that clinics receiving PEPFAR funds, even for building renovations, report from that time forward to PEPFAR, even if they discontinue using PEPFAR funds. Health workers interviewed consistently reported feeling undervalued and overworked because of the seemingly ever-increasing clerical aspect of their job. Donors and NGO directors are clearly aware of the burden such reporting requirements place on the workforce, and while the "saturated channel" effect had not been observed directly by any interviewees interviewed, one with intimate knowledge of Kenya suggested that the dynamic "certainly made sense" in the Kenyan context. Indeed, one interviewee, unbidden, suggested that the ultimate result of "Pencil Pushing" in Kenya was to drive the most capable workers out of the generalist workforce—either into private clinic practice or into roles with explicitly vertical programs—leaving PHC clinics staffed by workers lacking the skills or motivation to seek more fulfilling opportunities. "The most capable workers work for NGOs," according to one interviewee, because the work and pay are better and the hassles far lower. "Mediocritization" appears to be a very real dynamic in Kenya.

Policymaking Impact in Kenya

GHI implementation in many countries, Rwanda for one, is greatly enhanced by engaging the government as a thought and implementation partner. According to experts interviewed, this is not the case in Kenya. Kenya's notoriously "leaky" public funding streams decrease the impact of aid on the ground to such a point that NGOs obtaining Global Fund money, which flows through the Kenyan Ministry of Health, can expect to see 20 percent reach the ground. According to one interviewee, this stands in stark contrast to PEPFAR funds, which because they do not flow through Ministry coffers reach the ground with much higher efficiency. In part as a result of this inefficiency, most donors and GHIs operate in parallel with the Ministry, consulting on occasion but not collaborating on program design and implementation. This certainly creates tension between the two bodies, but it is not thought that this tension permeates as far down as the program delivery level. What is apparent, however, is that such parallel governance reveals all of the major problems identified in the literature: "Give a Man a Fish," "Give a Man a Car," "Give a Man an Elephant", and "I Just Work Here".

As discussed earlier, many people discuss policy "crowd out" as one of the key detrimental impacts of vertical aid. Policymakers can leave certain areas of policy up to outside groups, and as a result they spend neither the time nor resources necessary to build capability in that particular area.

One example of policy failure in Kenya is the decline and then resurgence in birthrate surrounding family planning programs. In the 1990s, family planning was the focus of much health aid directed to the country, and over a series of years birth control, education, and counseling saw the birthrate drop substantially. These programs were for the most part classic top-down aid programs, funded by international donors and implemented by Population Services International or similar non-profit groups. Their job done and other worthy causes calling, these groups eventually withdrew, leaving the country with a "car", in the form of a commitment to continue distributing birth control and education services, an "elephant" in the form of a program which, although perhaps suited to the lowest common denominator across several countries was likely not

especially well suited for the variety of local contexts across Kenya, and no "fishing pole", as Ministry officials had for the most part concentrated on other agenda items while leaving family planning up to NGOs. The end result of such parallel policymaking was serious enough to merit mention by 4 of 30 subjects interviewed for a separate project of which one of my interviewees had knowledge. Family planning programs across the country slowly ran out of resources and many dissolved completely. In the end, while the fertility rate had declined nearly 20% between 1994 and 2000, it did not continue to decline after 2000, and according to some may have increased more recently.

Kenyans are concerned that the same shift in priorities might happen with AIDS. Most of the ARV programs in the country are funded by both PEPFAR and the Global Fund, with PEPFAR delivering money directly to the NGOs who are planning and implementing programs. Due to the Global Fund's cyclical application process, Kenyans are wise to assume that that once ARV distribution is scaled up nationally the Global Fund will move on to other challenges. With the family planning example in mind, it is clear that the dynamics of parallel policymaking could take hold and end up undermining the distribution system that the Global Fund has sought to build. Some effort is underway to mitigate this. Kenya recently began work on an in-country operating plan for ARV distribution and delivery.

Market Impact in Kenya

As shown in Figure 6, vertical aid can feed a local healthcare economy by engaging entrepreneurs, which can have substantial positive feedbacks in driving long-term sustainability of the health system. The MEDS example detailed above and in Chapter 7 demonstrates the substantial benefit that at least one private sector organization in Kenya can derive from providing services vertical programs.

However, well-meaning interventions have destroyed some Kenyan private sector parties' trust in GHIs as fair dealing business partners. For example, over a period of three years the NGO Population Services International (PSI), through grants from USAID and DFID, developed a network of hand-picked stores and kiosks that were supplied

with effective insecticide treated bed nets (ITNs) to sell at a modest profit. These subsidized nets, 5% of which were procured from local manufacturers due to production constraints, were heavily branded and intensely marketed by PSI, and exerted substantial price pressure on the relatively small preexisting bed net market, which saw a 30% decline in sales before adapting and leveling off (Tilson 2007).

The program met its ambitious targets of a nearly 50% increase in bed net ownership between 2000 and 2003. However, in 2003 the government, under pressure from the WHO, increased its 2005 target for bed net usage dramatically and PSI was required to modify its distribution strategy. Instead of distributing solely through the private sector PSI began distributing the now more heavily subsidized nets through government clinics in addition to kiosks and stores. The impact of opening the second channel was substantial—whereas in the previous year private retail clinic sales doubled or tripled between February and June as malaria season picked up, after PSI opened the competing channel sales actually dropped over the same time period (Noor, et al. 2007). While it is clear that government health clinics were the more appropriate channel for bed net distribution, PSI's initial group of private kiosk and shop operators felt as though they had been taken advantage of. What's more, in 2006 PSI began experimenting with free ITN distribution through targeted mass campaigns, vastly improving bed net ownership and usage but also undercutting private sellers completely (Noor, et al. 2007). According to one Kenyan who has seen this series of events unfold, 'my friends are now stuck with twenty nets they cannot sell. They could have been selling Safaricom [mobile phone minutes] but instead sold SupaNet and PowerTab, and now next door they are giving them away for free.' While from a short-term public health perspective free distribution was clearly the best means of treating malaria, this series of events has likely dampened the enthusiasm of private sector entrepreneurs to engage not only in similar health sector enterprises, but also in future public health distribution schemes such as water purification and family planning.

Chapter 7: Potential for mitigation

Specialization of care provision need not result in fragmentation of care. Similarly "indirect" vertical delivery does not always result in mediocritization of the PHC workforce, and GHI involvement need not distort national policymaking infrastructure or domestic health care markets. Not only do the systems diagrams laid out in this thesis identify detrimental impacts of vertical interventions on health systems, they also illustrate intervention points which can "tip" a system from failure into success. Those tipping points are discussed in turn below:

Specialized Delivery

As demonstrated in chapter 4, specialized delivery can certainly enhance health outcomes, but it suffers from increasing barriers to care for patients. In order to mitigate this impact, specialized delivery can be closely coordinated with generalist care, where available. For example, co-location of STD screening with other health services can lower barriers to follow-up for those patients who require treatment for other conditions. A system of "directly observed referrals," where patients are either escorted or tracked when referred can similarly decrease loss to follow-up. With such a system, the benefits of specialization can be realized while mitigating the costs.

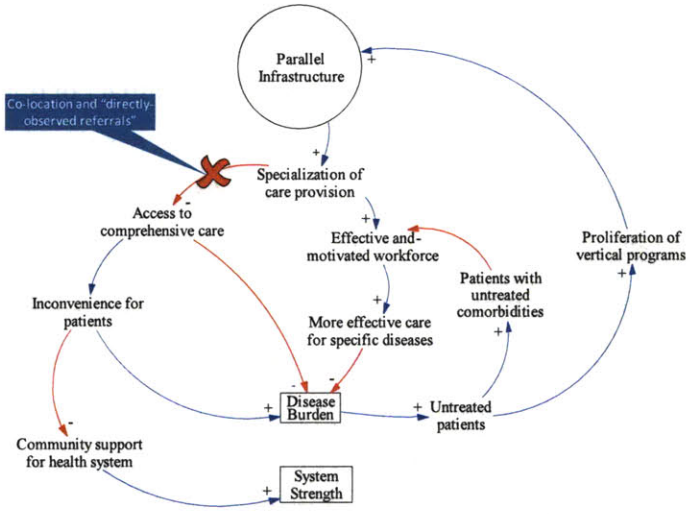


Figure 7: Intervention points in specialized delivery

The UPEC Chabaiywa Dispensary in Kipkarren, Kenya has developed a simple strategy for "directly observed referrals" that is probably not uncommon. As a general care health dispensary, the UPEC clinic treats patients for malaria, typhoid, and other common infectious diseases, in addition to providing immunization and emergency maternity services. The clinic is also a government-recognized Voluntary Counseling and Testing Centre (VCT) for HIV, and supports a cadre of community outreach workers

as part of the AMPATH Home Based Care program who provide door-to-door VCT and TB testing, along with bed net distribution. However, patients testing positive must travel approximately 15 km to a specialized AMPATH HIV clinic in the town of Turbo for prescription and distribution of ARVs, the cost of which (between $2 and $4 round trip) presents a substantial barrier to care. In order to decrease loss to follow-up and improve health outcomes, the UPEC clinic uses its ambulance to run free shuttles to the TURBO clinic every Friday. Not only does this allow the UPEC clinic to prevent potential negative consequences of specialized care, it also provides patients with a "support group" of patients with whom they make the two hour round trip.

Primary Health Care Delivery

PHC delivery is laid out by many as the ideal mode of global health intervention, particularly in the context of chronic diseases like HIV/AIDS. However, we have seen that as vertical programs are integrated into the PHC workforce they tend to degrade the skill and motivation of PHC workers, driving incentives for the establishment of separate specialist programs which draw the best and the brightest out of the PHC workforce.

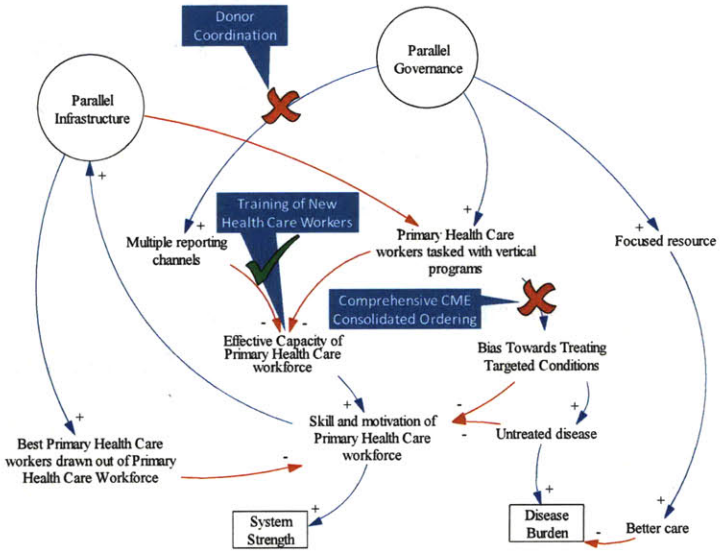


Figure 8: Intervention points in PHC delivery

Three intervention points can head-off that effect, however, allowing vertical care investments to enhance overall health care delivery.

Donor Coordination: Mediocritization of the PHC workforce is driven by two fundamental factors: pay differentials and worker motivation. Already today several NGOs are working towards standardizing health worker pay across economies, which as long as it is done without ties to any particular vertical program, can mitigate "pull" incentives for brain drain. With regards to worker motivation, numerous interviews

highlighted "Pencil Pushing" as a key de-motivator of good healthcare workers. Coordination in reporting requirements and channels can eliminate much of this reporting burden reducing the tendency of the system to push towards parallel infrastructure and mediocritization.

One common model of donor coordination is the GFATM's Country Coordinating Mechanism (CCM), which is found at the core of planning and distribution in all Global Fund countries. As it was conceived, the CCM was designed to bring Civil Society Organizations (CSOs) such as NGOs, advocacy groups, and implementers, engaging all relevant parties to coordinate planning and distribution of health care services. As GFATM acknowledged by its 2008 internal evaluation of CCMs, however, the mechanisms are of highly variable success and utility. To begin with, CCMs are GFATM-centric, "bring[ing] together key stakeholders across the three diseases," as opposed to health-sector wide (The Global Fund to Fight AIDS, Tuberculosis, and Malaria 2008). Notably, immunization and maternal health can operate outside programs for these three diseases, and although CCMs tend to have representatives of the NGO sector, the focus on "The Three Diseases" can serve to exacerbate de-emphasis of other important national health priorities. Equally important, the success of CCMs is highly contingent on the leadership and politics of the organizations involved (The Global Fund to Fight AIDS, Tuberculosis, and Malaria 2008). Anecdotally, observers report that CCMs in some countries simply exclude some of the largest players—including PEPFAR—due to personality conflicts and perceived threats to authority and power.

CCMs also have relatively little impact on the "pencil pusher" effect which so greatly impacts the delivery of care on the ground. "Coordination" can take on many forms, but in the end, donors must internally coordinate across many countries, and when their own stakeholders demand specific measures of success they must ensure that specific information is gathered at the local level. In order for donor stakeholders to be satisfied, they must both receive the information on action and outcomes that they require, and also trust that the information they receive is accurate. The reason for multiple reporting channels is that there is currently no single reporting channel which satisfies

both of these requirements, because governments lack the capacity to create such a system.

Therefore, what is needed is a coordinated effort among donors at the international level to create a mechanism to lend governments the capacity to create such a system, and to support them in maintaining it (Grepin 2007). In doing so, donors must relinquish a bit of autonomy in determining what metrics are used, NGOs must be provided with incentives to implement the system resulting from such implementation, such as two-way information flows that can help NGOs determine how well they are doing, and governments must feel ownership in the maintenance of such systems. The process by which this initiative comes about could look like this:

1. A single donor commits to facilitating the harmonization of international donor requirements for health information systems, and also to supporting countries in implementation.

2. That donor hosts an international conference through which donors establish a set of twelve "cardinal measures" from which they can evaluate program progress and performance. Donors then commit to accepting these measures in place of others.

3. That donor provides technical assistance to national governments in altering existing health information systems to collect such data, and in establishing systems where none exist. This should include support for electronic transcription into medical records, such as the open systems now in use by Partners in Health and other organizations, but should not be limited to electronic entry.

The key to this process is that donors coordinate only once, that coordination is translated into processes, and these processes can then operate autonomously without the need for further donor coordination.

Training of New Health Workers: The burden of addressing uncoordinated reporting channels and time spent in external training decreases the effective capacity of the healthcare workforce. Drawing new workers into the PHC workforce can mitigate these effects by increasing overall capacity, taking administrative burden off of workers, and providing a more effective channel for delivery of all interventions.

Observers have recently noted the critical need for training *new* workers as opposed to existing workers. The Center for Global Development, in its recent report on the impact of HIV aid on health systems, suggests that startling little money for health worker training has actually gone towards training new health workers, and identifies funding for new worker training as one of three major recommendations for mitigating the negative impact of HIV funding on health systems (Oomman, Bernstein and Rosenzweig 2008). Donors are likely reluctant to provide such funding for three reasons. First there is a substantial delay between training new health workers and impact on health outcomes, which not only delays time to impact but also disaggregates the specific intervention from its results. Strategies to mitigate this could include adapting standard medical curricula to allow for earlier practical clinical, and "naming" training such that graduates become "PEPFAR-certified health workers". Second, healthcare training infrastructure in many developing countries is either substantially underdeveloped or in many cases completely absent. While this presents a substantial barrier to establishing medical training courses in many countries, expanding the capacity of existing campuses and making them regional international hubs of training could be an interim step in expanding overall health training infrastructure. Finally, many have observed that granting workers "portable degrees" can increase the opportunity for emigration and "brain drain". While it is unlikely that emigration could be stopped, the dynamics of the system laid out above suggest that increasing the overall capacity of the healthcare workforce can decrease motivation for brain drain by providing workers with a motivating and stimulating work environment.

It is likely that these and other strategies have been identified and tried in places across the world, although I was unable to identify such examples. The fact that it is so difficult

to identify and access information on what has been tried, what has succeeded, and what has failed points to a great opportunity to improve the development of health systems globally by facilitating information sharing among program implementers. That being said, strategies for augmenting the generalist health care workforce certainly merit greater discussion than can be afforded here.

Comprehensive CME and Consolidated Ordering: The bias of de facto specialized PHC workers to treat certain conditions stems from specialized training and relative lack of availability of certain supplies. This problem can be corrected by supporting comprehensive continuing medical education (CME) curricula, and by eliminating parallel systems of drug and supply availability.

Continuing Medical Education is a staple mechanism for preserving quality in healthcare delivery across the developed world, and donors frequently support such training in developing world health interventions. As we have seen above, coordination among donors is a consistent problem in many areas of global health delivery, but it is essential that such training be coordinated in order to preserve the integrity of PHC. Engaging health workers in the training of new primary health care workers, as suggested above, can provide one mechanism for preserving and enhancing the generalist skills of the PHC workforce. Incentives in the form of policies or rewards coming from donors and governments can increase the likelihood that workers will remain engaged in CME throughout their careers.

At the same time, it is critical that PHC workers have access to treatments for both targeted and non-targeted conditions. Although donors traditionally fund the purchase and distribution of treatments for their diseases of focus, I have shown above that co-morbidities create substantial problems for vertical programs if they are allowed to perpetuate. Therefore, it would make sense for donors to expand the list of supplies they fund and distribute to include treatments outside of their traditional treatment baskets. In addition, the Kenya example provides interesting insight into the power of donor supply chains to improve access to all medications. As noted in Chapter 6, the MEDS drug distribution scheme utilized by PEPFAR and others in Kenya has, in recent

years, greatly expanded its catalog of medications and supplies. As a result, more clinics have reliable access to a wider variety of medication, and although evidence is not available to demonstrate an impact on care, it is safe to assume that workers supplied by MEDS are now better able to treat a wider variety of problems when they present. Were donors in other countries to help their distribution partners expand similarly, problems created by limited treatment options could similarly be avoided.

Policymaking

The system of impacts seen in policymaking is complex, but a few simple intervention points can drive the system down the pathway of long-term enhancement of system strength.

Preservation of Policymaker Authority: Coordination with national policymakers is recognized as important, but as discussed above, coordination does not circumvent the problem of policymaker responsiveness to constituents rather than donors. In order to preserve policymaker responsiveness to the needs of the country rather than the needs of the donor, policymakers must have the authority to direct funds as they see fit. Although SWAp and SWiM mechanisms are fairly common, trusting Ministries prone to corruption and cronyism with billions of dollars is a difficult proposition for many donors. CCMs can actually exacerbate the problem of responsiveness to donors rather than citizens. According to interviewees, in some countries it is the leader of an NGO or a local WHO

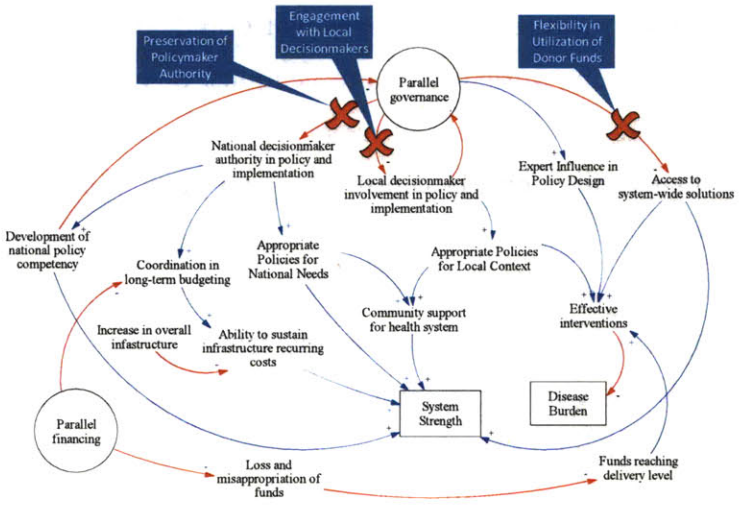


Figure 9: Intervention points in policymaking

representative rather than a government policymaker who essentially controls the agenda of the CCM.

It is exceedingly difficult to identify pathways around this dynamic. One conceivable solution is for donors to assemble advisory committees of citizens or conduct audit surveys to better understand whether programs actually meet the needs of citizens. However, rather than preserving policymaker authority this solution actually circumvents policymakers. This being the case, perhaps SWAp and SWiM mechanisms provide the best, although imperfect, mechanism for preserving local policymaker authority. It is clear, however, that maintaining policymaker accountability to citizens rather than donors is crucial to mitigating negative system impacts.

Engagement with Local Policymakers: Without local support for policies, initiatives can be ill-suited to local context upon implementation, and as a result can damage long-term support for health systems themselves. The international NGO Partners in Health (PIH) provides an instructive model of decentralized NGO policymaking, proscribing broad goals but not specifics of implementation mechanisms. PIH's model is one of local scale-up, rather than top-down policymaking. Health care deliverers at the local level, nearly all of whom are domestic citizens, have the power not just to deliver care, but also to solve problems, for example, providing food aid to families who need it and establishing clean water facilities where there are none.

Flexibility in Utilization of Donor Funds: Tying donor funds to specific program goals or mechanisms necessarily limits the solution set which policymakers—be they donor, NGO, or Ministry officials—have to work with. SWAp and SWiM mechanisms are one means of preserving flexibility, but converting to a full basket approach may not be necessary. In some countries, PEPFAR has show an encouraging loosening of its traditionally proscriptive policies, as recognized by interviewees from a few PEPFAR nations. In its 2007 evaluation of PEPFAR, the Institute of Medicine strongly recommended an "enhanced ability to tailor interventions to the nature of the epidemic in each country...through removal of the limitations imposed by congressional budget allocations for particular activities" (Sepulveda, et al. 2007) While the IOM's

recommendation was targeted at eliminating requirements for abstinence-only intervention programs and was focused at the national level, the principle is just as valid at the local level. Widespread embrace of "flexibility" may not satisfy the accountability requirements of donor stakeholders, however. That being the case, it is possible that a formal program review process might permit flexibility in implementation that is presently prohibited. For example, allowing implementers to use 20% of PEPFAR funds for non-HIV/AIDS related activities could allow programs to meet the needs of more of the community, without seriously compromising donor mission.

Internal Health Care Economy

As has been stated, far less is known about the impact of vertical programs on internal markets for health care goods and services. However, it is clear that engagement with the local private sector, in developing vested interests in maintaining health care infrastructure and access, can enhance the long-term sustainability of health care services within many developing countries. With the limited data available two intervention points can be identified.

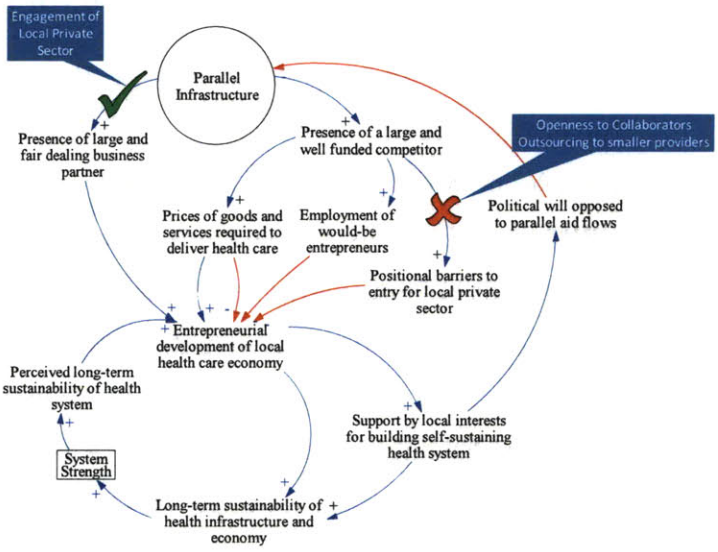


Figure 10: Intervention points in internal health care economy

Engagement of Local Private Sector, Openness to Collaboration, and Outsourcing to Smaller Providers: The billions of dollars flowing into developing health economies is today largely captured by NGOs and large entities, rather than filtering into local economies. While some speculate as to effects on prices and the labor market, not enough is known at this point to recommend interventions that would impact such dynamics. However, It is evident that engagement of the local private sector is not a primary concern for donors and major NGO implementers, which amounts to an

enormous missed opportunity. By engaging the local private sector in a fair-dealing manner, collaborating with and outsourcing to local providers where possible, donors, NGOs, and Ministries of Health can build the foundation of a workforce and infrastructure that can manage projects in the future. Short-term losses to relative inefficiency of smaller providers are a small price to pay for long-term sustainability of infrastructure and the eventual obsolescence of global aid for health.

The Global Fund Global Management Solutions (GMS) mechanism, discussed in Chapter 4, exemplifies one method of positive private sector engagement. GMS has a mission of engaging local service providers in assisting recipients in implementing GFATM grants, and their activity runs the spectrum from accountants helping clinics set up accounting systems, to consultants helping CCMs work through communication and management difficulty. GMS engages service providers from outside the health arena, and those who are successful are employed on future projects, drawing them into the health care economy and building future capacity for program development and implementation.

PEPFAR's utilization of MEDS in Kenya is a much larger scale example of donors engaging the local private sector and, as a result, increasing the long-term sustainability of the health system. MEDS, the Mission for Essential Drugs and Supplies, is a private sector non-profit drug procurement and distribution organization founded in 1986 by the Kenya Episcopal Conference and Christian Health Association of Kenya. It was originally designed to deliver supplies to the hundreds of mission-affiliated health clinics scattered across Kenya. With a nationwide network and quality reputation, MEDS presented as an ideal partner with PEPFAR began distributing ARVs in Kenya. The capital infusion from PEPFAR has allowed MEDS to expand dramatically, increasing the overall volume of drugs pushed through the system eight-fold since PEPFAR's entry.[6] MEDS also has policies that favor local suppliers and manufacturers, with 90% of its supplies sourced locally and 70% of stock coming from Kenyan manufacturers (WHO 2004). As PEPFAR's custom has allowed this private sector organization to flourish, it is

[6] Source: personal interview

highly likely that the effects have reverberated into that community of Kenyan suppliers and manufacturers.

Chapter 8: Conclusion

The system of global health aid is an incredibly complex web of cause and effect, complicated by the dearth of data available to inform analyses and decision-making. Visual representation of these systems can provide policymakers with a tool to understand potential unintended consequences of their actions. It is clear that, if the diagrams derived from the literature represent reality, a few key intervention points can prevent systems from "tipping" into undesirable dynamic effects, and while these interventions are not necessarily new to the field, this analysis provides support for their preferential implementation over alternatives.

In conducting my analysis, I came across several surprising insights that may be valuable to share with the broader global health community. I also believe that several of the tools used in this analysis, the effects uncovered, and strategies for mitigation represent valuable contributions to the literature and practice of global health delivery.

Surprises

At the beginning of this work I expected to find substantial heterogeneity in the literature regarding the impact of various vertical interventions on the multitude of health systems in which they operate. This certainly proved to be the case. At the same time, I suspected that putting this universe of causality in front of experts versed in the field would call-out a rather limited set of key dynamics at play in the current context. Surprisingly, although certain elements of context were consistently mentioned as affecting the overall dynamics of the system, relatively little agreement on the underlying fundamental impacts within the system. This suggests that, although the global health community may have learned substantial lessons over the past forty years of vertical global health intervention, heterogeneity in implementation is still a dominant characteristic of global health. Experimentation seems to dominate over the implementation of best practices because knowledge sharing is not common practice . This provides an opportunity for analyses such as this to highlight mistakes still made in

global health delivery, and to suggest mitigation strategies that should become common practice.

At the same time, it is surprising to note that the limited, largely qualitative, and anecdotal literature reviewed seems to have uncovered all of the dynamics observed personally by the experts interviewed for this thesis. This finding suggests that even in situations where definitive qualitative analysis is made impossible by contextual ambiguity and limited data availability, qualitative analyses using the best information available can lend "good enough" insight and serve as a useful tool in conducting systematic analyses.

Finally, as highlighted in Chapter 4, I was quite surprised to have found relatively limited mention in the literature of important impacts on internal health care economies. I am by no means a rigid ideological capitalist, but having spent five years working in U.S. politics, I know personally how important private sector players are in establishing and soliciting support for essential policies and infrastructure—oftentimes public sector goals are best achieved through private means—and it seems that this point is largely missed by the global health delivery community. Although some observers, such as Mead Over at the Center for Global Development, write of the utility of the private sector in implementing health programs, relatively few investigations have explored the substantial positive and negative spillovers between vertical programs and health care economies. A thriving domestic health care economy not only helps people get healthy, but it also provides a hedge against future diversion of resources for other purposes such as national defense. As the debate inspired by Dambisa Moyo's recent "Dead Aid" hypothesis raises the question of whether aid itself is good for domestic economies, understanding the market impact of such aid is more vital than ever (Moyo 2009). In my judgment this reveals a significant opportunity for researchers to add to the knowledge of the field and effectiveness of future aid programs.

Contributions

This thesis contributes to the field of global health delivery by constructing a framework for understanding dynamic effects of vertical health aid, by characterizing crucial dynamics which send a system out of control, and by identifying mitigating strategies that can help vertical programs strengthen rather than harm health systems worldwide. My hope is that these contributions, laid out in detail below, will ultimately help to lower the barriers to self-fulfillment which health problems create for millions in the developing world.

First, I believe that this is the first time the broad universe of hypothesized and observed impacts of vertical programs on health systems have been laid out as a discrete and comprehensive system. Many authors have made deep and valuable investigations into limited sets of these impacts, but by laying out all such relationships as a dynamic system, this work allows policymakers to understand potential unanticipated consequences of their actions. The tools of system dynamics are clearly useful in helping to aggregate diverse impacts in order to understand a system as complicated as global health delivery.

Second, I believe that the specific effects identified in the course of assembling the broad universe of impacts and named in this thesis, such as the "Doctors with Hammers" effect, the "Give a Man an Elephant" effect, and the self-reinforcing "Mediocritization" loop, accurately describe some of the most important dynamics playing out today in countries across the globe. Understanding them as modes of system behavior—having the terms enter the lexicon as heuristics for commonly observed phenomena—could help policymakers and practitioners remain aware of potential failure modes for their own interventions, mitigating problems before they start.

Second, I believe that some of the distinctions and categorizations made in this investigation represent valuable frameworks for examining potential impacts of vertical programs. Specifically, the disaggregation of overall vertical approaches into parallel infrastructure, parallel governance, and parallel financing is a very useful tool in helping to understand the impacts of specific programs on health workforce, policymaking, and

other areas. Many authors, and organizations such as the WHO, unpack these parallel structures even further into Health Information System, Health Workforce, Health Infrastructure, and so on. However, in some cases such detail makes developing an understanding of the overall system dynamics needlessly complicated. Understanding the fundamental differences between parallel infrastructure effects and parallel governance effects, in particular, is a very useful tool in anticipating how strains on health systems may affect future program development.

Third, identification of specific points for mitigation brings some clarity to the current debate on improving GHI programs. Although many observers highlight, for example, the need to consolidate reporting systems, improve comprehensive access to medicines, and train new workers, the systems identified in this thesis highlight the complementary nature of these three interventions. Additional analysis could more clearly characterize the degree to which these mitigation strategies either complement or undermine each other. Even still, using these dynamic diagrams as guides can help individuals put their recommended solutions in context with others' recommendations.

Some specific mitigation strategies deserve further investigation and potentially implementation. For example, the suggestion that PEPFAR and other donors develop "branded" training programs to both enhance overall system capacity and derive benefits from soft-diplomacy may prove useful as PEPFAR 2 moves closer to systems support. Additionally, the need to coordinate health reporting systems is clearly a priority for many in the global community, but it is clear to me that this will never happen without a discrete policy-setting event such as a global conference, nor without donors surrendering a bit of sovereignty in accepting collaboratively constructed measures.

Limitations

The qualitative nature of this investigation does have some significant drawbacks. Without quantitative measures of any of these effects it was impossible to determine the relative importance of their impact on systems in general. In addition, it was not possible to determine the relative importance of different factors in driving common

dynamics. For example, the "Pencil Pusher" effect and "80:20" effect both contribute to demoralizing PHC workers and driving the "Mediocritization" loop. It is unclear, however, if one of these effects tends to predominate, if they tend to be additive or multiplicative in their effect, or of mitigating one is enough to mitigate negative consequences for the system.

A more fundamental limitation to this analysis is its grounding in the prevailing "mental model" of the field. One of the most important uses of system dynamics is to understand these mental models better and to quantitatively demonstrate areas in which they do not necessarily map to reality. This thesis has uncovered such inconsistencies in a few places, for example by highlighting the unsustainable nature of some "indirect" vertical programs. However, data would allow the construction of quantitative models that could, for example, demonstrate that some effects are either overblown or significantly underestimated by researchers and practitioners. Similarly, I have tried to keep these models relatively simple to meet constraints of both time and communication efficiency, and I believe that in doing so I have still uncovered the fundamental driving dynamics of this system. However, in an additional iteration I would like to add layers of complexity, such as delays and a more explicit understanding of system strength as a "stock" fed by "flows."

If I were to conduct this research over again, I would attempt to, if not directly quantify, at least rank the relative importance of effects such as these through a broad-based survey of practitioners. While expert interviews are invaluable in highlighting subtle dynamics and providing case examples and counterexamples of the effects identified in the literature, asking a broad set of experts to rank-order these effects might prove useful in targeting the most important dynamics with limited global health resources.

Finally, I very much look forward to reviewing the results of the ongoing WHO Positive Synergies Project, carried out in part by colleagues at the Global Health Delivery Project at the Harvard School of Public Health. This work is examining the same universe of issues as this thesis has explored, conducting hundreds of formal interviews in more than ten countries. If I had begun this investigation next year rather than this year the

dataset generated by these interviews would have been phenomenally valuable in calibrating and testing the dynamic maps I have created. In conferring with individuals involved in that research I am told that my findings and theirs are closely correlated, and I look forward to reading their in-depth analyses.

Predictions

At the risk of hubris exceeding my standing as a Master's candidate, I'd like to make a couple of predictions guided by the dynamics uncovered in my investigation. The first of these is that the present oscillation of global health focus towards PHC and away from vertical interventions will be much more sustained than the push following Alma Ata. PHC infrastructure is crucial to the maintenance care of HIV/AIDS, and donors understand that because they have now made a commitment to sustaining millions of people on ARVs, their long-run financial interests are by far better served by building PHC health systems than by allowing "Mediocritization" effects to take hold.

My second prediction is that PEPFAR and other donors will begin to support basic health care training to a far greater degree than they do today. The specialist care delivery mode is far inferior to organizations seeking to build long-term capacity, but it is clear from the analysis in this thesis that it is extremely difficult to avoid specialization without enhancing the overall number of health workers in the system.

My final prediction...and indeed my deeply held hope...is that in thirty years the context for this debate will be vastly different. Rather than the developed world seeking to aid developing world health systems through financial aid, they will actually be trying to glean lessons for their own health systems from a few exemplars of health system reform, perhaps Rwanda or Botswana. Major hospitals in the developed world will be using low-cost medical tools and devices originally developed for resource-poor settings, pushed by cost pressures and system inefficiencies to adopt lower-technology, lower-cost, but highly effective technologies. The brain drain of medical professionals may even be reversed, with energetic and creative entrepreneurs from the developed world finding substantial opportunities for impact in developing world health systems.

The need for much global health aid will have been obviated...and we can all retire having changed the world.

Bibliography

AlertNet. *FACTSHEET: Top killer diseases in the developing world.* November 2006. http://www.alertnet.org/topkillerdiseases.htm (accessed 4 30, 2009).

Atun, Rifat, Sarah Bennett, and Antonio Duran. *When do vertical (stand-alone) programmes have a place in health systems?* Policy Brief, Geneva: World Health Organization, 2008.

Banerji, D. "Political context of the work of international agencies—A fundamental shift in the approach to international health by WHO, UNICEF, and theWorld Bank: instances of the practice of 'intellectual fascism' and totalitarianism in some Asian countries." *International Journal of* 29, no. 2 (1999): 227–259.

Bate, Roger. *Private sector and public sector malaria treatment in Africa: The challenge of getting the best drugs into the hands of the people who need them.* Africa Fighting Malaria Bulletin, Washington, DC: American Enterprise Institute, 2008.

Bhutta ZA, Gupta I, de'Silva H, et al. "Maternal and child health: is South Asia ready for change?" *BMJ* 328 (2004): 816–19.

Birdsall, Nancy. *Seven Deadly Sins: Reflections on Donor Failings.* Washington, DC: Center for Global Development, 2004.

Brautigam, Deborah, and Stephen Knack. "Foreign Aid, Institutions, and Governance in Africa." *Economic Development and Cultural Change* 52, no. 2 (2004): 255-285.

Briggs, C J, and P Garner. "Strategies for Integrating Primary Health Services in Middle- and Low-Income Countries at the Point of Delivery." *Cochrane Database of Systematic Reviews*, no. 2 (2006): CD003318.

Brown, Adrienne. *Integrating vertical programmes into sector-wide approaches: experiences and lessons.* London: HSLP Institute, 2001.

Brown, TM, M Cueto, and E Fee. *The World Health Organization and the transition from "international" to "global" public health.* Cape Town: Global Health Trust, 2004.

Bryant, JH. *Health and the Developing World.* Ithaca, NY: Cornell University Press, 1969.

Chen, L, Timothy Evans, and et al. "Human Resources for Health: Overcoming the Crisis." *Lancet* 364, no. 9449 (2004): 1984-1990.

Chen, LC. *Harnessing the power of human resources for achieving the MDCs.* Geneva: World Health Organization, 2004.

Clinton, President Bill. *XVII International AIDS Conference HIV/AIDS and Health System Reform: Achieving Universal Coverage.* Kaisernetwork.org, 2008.

Cochi SL, De Quadros CA, Dittman S, Foster SO, Galvez Tan JZ, Grant FC, Olive´ JM, Pigman HA,. "Group report: what are the societal and political criteria for disease." In *The Eradication of Infectious Diseases*, by Hopkins DR (eds). Dowdle WR. West Sussex.: John Wiley & Sons, 1998.

Commission for Macroeconomics and Health. *Investing in health for Africa's socioeconomic development.* Geneva: World Health Organization, 2002.

Commission on Macroeconomics and Health. *Improving health outcomes of the poor. Report of Working Group 5.* Geneva: World Health Organization, 2002.

Conn, CP, P Jenkins, and SD Touray. "Strengthening health management: experience of district teams in The Gambia." *Health Policy and Planning* 11, no. 1 (1996): 64–71.

De Waal, Alex. "Major Challenge, Minor Response." *Foreign Affairs*, 2007.

"Declaration of Alma-Ata." *International conference on primary.* Alma-Ata, USSR., September 6–12, 1978.

England, Roger. "The Fight Against AIDS in the Larger Context: the end of 'AIDS exceptionalism'." *UNU-Cornell Africa Series Symposium: The social and economic dimensions of HIV/AIDS in Africa.* New York, September 9, 2008.

Garrett, Laurie. "The Challenge of Global Health." *Foreign Affairs*, 2007.

Gish, O. "The political economy of primary care and 'Health by the People': an historical exploration." *Social Science & Medicine* 13C (1979): 203-211.

Gonzalez, C L. *Mass Campaigns and General Health Services.* Geneva: World Health Organization, 1965.

Grepin, Karen. "Conceptualizing Integration: A Framework for Analysis Applied to Neglected Tropical Disease Control Partnerships." *PLoS Neglected Tropical Diseases* 2, no. 4 (2007): e174.

Grépin, Karen. "Too much of a good thing: Is HIV/AIDS funding strengthening African Health Systems?" forthcoming, 2009.

Hanson, K, K Ranson, V Oliviera-Cruz, and A Mills. "Expanding access to priority health interventions: a framework for understanding the constraints to scaling-up." *J Int Dev* 15 (2003): 1-14.

Iglehart, John. "Advocating for Medical Diplomacy: A Conversation with Tommy G. Thompson." *Health Affairs*, May 2004: Web Exclusive.

"Integration of health care delivery. Report of a WHO study group." In *Technical Report Series, No. 861*. Geneva: World Health Organization, 1996.

Jamison, Dean T. *Disease Control Priorities in Developing Countries.* Washington, DC: The World Bank, 2006.

Loevinsohn, B, and et al. "Impact of targeted programmes on health systems: a case study of the polio eradication initiative." *American Journal of Public Health* 92 (2002): 19-23.

May, Maria, Joseph Rhatigan, and Richard Cash. *BRAC's Tuberculosis Program: Pioneering DOT treatment for TB in rural Bangladesh.* Case, Global Health Delivery Project, Cambridge, MA: President and Fellows of Harvard College, 2008.

McKeown, T. *The role of medicine: dream, mirage, or nemesis?* Oxford: Blackwell, 1979.

McNeil, Jr., Donald G. "Plan Tries to Lower Malaria Drug Cost." *The New York Times*, April 17, 2009.

Mills, Anne. "Mass campaigns versus general health services: what have we learnt in 40 years about vertical versus horizontal approaches?" *Bulletin of the World Health Organization* 83, no. 4 (April 2005): 315-316.

Mills, Anne. "Vertical vs Horizontal Health Programmes in Africa: Idealism, Pragmatism, Resources and Efficiency." *Social Science & Medicine* 17, no. 4 (1983): 1971-1981.

Mogedal, S, and B Stenson. *Disease eradication: friend or foe to the health system?* Geneva: World Health Organization, 2000.

Molyneux, David. ""Neglected" diseases but unrecognised successes—challenges and opportunities for infectious disease control." *Lancet* 364 (2004): 380-383.

Moran, Mary, et al. "Neglected Disease Research and Development: How Much Are We Really Spending?" *PLoS Medicine* 6, no. 2 (2009): e1000030.

Moyo, Dambisa. *Dead Aid.* New York: Farrar, Straus, and Giroux, 2009.

Msuya, Joyce. *Horizontal and Vertical Delivery of Health Services: What Are The Trade Offs?* Washington: World Bank, 2005.

Noor, Abdisalan M., Abdinasir A. Amin, Willis S. Akhwale, and Robert W. Snow. "Increasing Coverage and Decreasing Inequity in Insecticide-Treated Bed Net Use among Rural Kenyan Children." *PLoS Medicine* 4, no. 8 (2007): e255.

Oliveira-Cruz, Valeria, Christoph Kurowski, and Anne Mills. "Delivery of Priority Health Services: Searching for Synergies Within the Vertical Versus Horizontal Debate." *Journal of International Development* 15 (2003): 67-86.

Oomman, Nandini, Michael Bernstein, and Steven Rosenzweig. *Seizing the Opportunity on AIDS and Health Systems.* Washington: Center for Global Development, 2008.

Peters, David, and Shiyan Chao. "The sector-wide approach in health: What is it? Where is it leading?" *The International Journal of Health Planning and Management* 13, no. 2 (1998): 177-190.

Reinikka, Ritva. "Donors and Service Delivery." In *Reinventing Foreign Aid*, by William Easterly, 179-200. Cambridge: MIT Press, 2008.

Roll Back Malaria External Evaluation. *Achieving Impact: Roll Back Malaria in the Next Phase.* Roll Back Malaria, 2006.

Sepulveda, Jaime, et al. *PEPFAR Implementation: Progress and Promise.* Institute of Medicine, Washington, DC: National Academies Press, 2007.

Smith, DL, and JH Bryant. "Building the infrastructure for primary health care: an overview of vertical and integrated approaches." *Social Science & Medicine* 16, no. 9 (1988): 909–917.

Spinaci, Sergio, Louis Currat, Padma Shetty, Valerie Crowell, and Jenni Kehler. *Tough choices: investing in health for development.* Commission on Macroeconomics in Health, Geneva: World Health Organization, 2006.

Sterman, John. *Business Dynamics: Systems Thinking and Modeling for a Complex World.* McGraw-Hill, 2000.

The Global Fund to Fight AIDS, Tuberculosis, and Malaria. *Lessons Learned in the Field of Health Financing and Governance: A Report on the Country Coordination Mechanism Model.* Geneva: The Global Fund to Fight AIDS, Tuberculosis, and Malaria, 2008.

Tilson, Dana. "The Social Marketing of Insecticide-Treated Nets (ITNs) in Kenya." June 2007. http://www.casesjournal.org/volume1/commissioned/cases_1_12.cfm (accessed April 22, 2009).

Travis, Phyllida, Sara Bennett, and Andy Haines. "Overcoming health-systems constraints to achieve the Millennium Development Goals." *Lancet* 364 (2004): 900–06.

Unger, Jean-Pierre, Pierre De Paepe, and Andrew Green. "A code of best practices for disease control programmes to avoid damaging health services in developing countries." *International Journal of Health Planning and Management* 18 (2003): S27-S39.

Victora, C, A Wagstaff, j Schelllenberg, and et al. "Applying an equity lens to child health and mortality: more of the same is not enough." *Lancet* 362 (2003): 233-241.

Walsh, JA, and KS Warren. "Selective primary health care: an interim strategy for disease control in developing countries." *N Engl J Med* 301 (1979): 967–74.

White, Howard. "The Macroeconomic Impact of Development Aid: A Critical Survey." *The Journal of Development Studies* 28, no. 2 (1992): 163-240.

WHO. *Everybody business : strengthening health systems to improve health outcomes : WHO's framework for action.* Geneva: World Health Organization, 2007.

WHO. *High level forum on the health MDGs.* Geneva: World Health Organization, 2004.

—. "Meeting on the impact of targeted programmes on health systems: a case study of the Polio Eradication Initiative. Department of Vaccines and Biologicals,." Geneva, December 16-17, 1999.

WHO. *Mission for Essential Drugs and Supplies, Kenya: Case Study.* Geneva: World Health Organization, 2004.

WHO. *World Health Report 2004: changing history.* Geneva: World Health Organization, 2004.

WHO. *World Malaria Report.* Geneva: World Health Organization, 2008.

World Economic Forum. "Vaccination campaign for all world's children launched at World Economic Forum." *World Economic Forum.* 01 31, 2000. http://www2.weforum.org/site/knowledgenavigator.nsf/Content/Vaccination%20campaign%20for%20all%20world's%20children%20launched%20at%20World%20Economic%20Forum_20004811.html?open&industry_id=9 (accessed 03 30, 2009).

Appendix

Acronyms

AIDS – Acquired Immune Deficiency Syndrome
AMPATH – Academic Model Providing Access in Medicine
APHIA – AIDS, Population, and Health Integrated Assistance
ARV – Anti-Retroviral therapy
CCM – Country Coordination Mechanism
CSO – Civil Society Organization
DFID – Department For International Development
GAVI – Formerly Global Alliance for Vaccination and Immunization
GFATM – Global Fund to Fight AIDS, Tuberculosis, and Malaria
GHI – Global Health Initiative
GMS – Global Fund Grant Management Solutions
HIV – Human Immunodeficiency Virus
ITN – Insecticide Treated Bed Nets
KEMSA – Kenya Medical Supplies Agency
MDGs – Millennium Development Goals
MEDS – Mission for Essential Drugs and Supplies
MoF – Ministry of Finance
MoH – Ministry of Health
NGO – Non-Governmental Organization
PEPFAR – President's Emergency Plan For AIDS Relief
PHC – Primary Health Care
PIH – Partners in Health
PSI – Population Services International
STD – Sexually Transmitted Disease
SWaP – Sector-Wide Approach
SWiM – Sector-Wide Management
TB - Tuberculosis
UN – United Nations
USAID – United States Agency for International Development
VCT – Voluntary Counseling and Testing
WHO – World Health Organization

Glossary of Effects Identified

- Specialist Health Care
    - **"Good Specialists" effect** – specialization focuses resources and makes relatively lower-skilled workers more effective in delivering care
    - **"80:20" effect** – workers with access to only a few interventions use them, inadvertently, to treat patients with other diseases
    - **"Grandma's Remedies" effect** – patients fed-up with visiting different specialists give up and resort to alternative treatment...or no treatment
    - **"Nero Fiddling" loop** – a specialized delivery system cannot treat all conditions or co-morbidities, and as these diseases go untreated they decrease the overall effectiveness of specialist care, further increasing disease burden
    - **"Next Big Cause" effect** – as the "Nero Fiddling" loop propagates, donors see opportunities and need for additional vertical aid programs.
- Generalist Health Care
    - **"Indirect Vertical Program" effect** – as PHC workers are given tools and training for vertical programs, they deliver PHC alongside vertical care
    - **"Doctors with Hammers" effect** – PHC workers receiving training and supplies to treat specific diseases are biased towards treating those diseases...even in patients with other conditions
    - **"Pencil Pusher" effect** – As more vertical programs are implemented through PHC workers, the paperwork burden decreases time spent with patients and workers become miserable
    - **"Saturated channel" effect** – As PHC workers are loaded down with paperwork and made miserable, additional programs are implemented through parallel infrastructure
    - **"Brain Drain and Mediocritization" effect** – programs implemented through parallel infrastructure present better opportunities for the most skilled PHC workers, who exit the PHC workforce, leaving behind worse workers
- Top-down Policymaking
    - **"Call the Experts" effect** – International experts called in to set policies draw on extensive experience and bring unique ideas

- **"Give a Man a Fish" effect** – Policy setting by international experts does not help policymakers learn to set their own policy, making them unattractive to future programs who hope to integrate policymaking with the government
- **"Give a Man a Car" effect** – Large programs which establish infrastructure require maintenance in the long run, and often country budgets are focused elsewhere
- **"Give a Man an Elephant" effect** – Programs established without adequate government consultation do not meet the needs of the community, and when donors leave they are abandoned
- **"I Just Work Here" effect** – Local policymakers and administrators are not involved in establishing programs, and have no stake in their success

- Distortions in Markets
  - **"Stimulus" effect** – The presence of a large and fair dealing business partner creates opportunities for local businesses and entrepreneurs to enter the healthcare economy
  - **"Western Prices" effect** – Large NGOs distort prices by either paying above market rates for goods and sucking up supply, or by using substantial buyer power to negotiate low prices
  - **"NGO Crowd Out" effect** – NGOs who establish themselves in a market occupy enough market share to make entry unattractive for others
  - **"Economic Momentum" effect** – Entrepreneurial energy and economic engagement with the health care economy builds long-term system strength, which makes the health care economy relatively less risky and more attractive for future entrants
  - **"Political Capital" effect** – A vibrant health care economy builds political will to develop a long-term sustainable health care economy.